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Aolynk DR814Q ADSL2+ Broadband Router
User Manual

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User Manual

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Table of Contents

1 Product Overview

This chapter focuses on the appearance and functionality of Aolynk DR814Q ADSL2+ Broadband Router for you to get familiar with this product.

1.1 Introduction

The Aolynk DR814Q ADSL2+ Broadband Router (hereinafter referred to as the DR814Q), featuring built-in ADSL2+ technology, high-speed Internet access, and remote connectivity, is an ideal tool for SOHO users. It enables LAN users to share high speed broadband connection through the built-in NAT and DHCP server and provides complete network security solutions to prevent the hackers and invasions from outside. In addition, it meets the network requirements as it supports multiple connections such as PPPoE, PPPoA, IPoA, and bridging.

With DR814Q, you can bind Ethernet ports to PVCs (permanent virtual circuit) and set corresponding QoS parameters to have multiple services provided through different PVCs across a single ADSL connection.

The DR814Q offers the Web configuration pages as the way to configure it via common Web browsers. Friendly built-in graphical user interface eases the configuration and management.

This user manual introduces how to install and configure the DR814Q. After guiding you through the device connection and basic configuration, it focuses on the advanced configuration for you to operate the DR814Q optimally.

1.2 Appearance

1.2.1 Front Panel

The LEDs on the front panel indicate the state of the DR814Q.

Figure 1-1 Front view

Table 1-1 LED state description of the DR814Q

LED	State	Description
Power	ON	The power is ON and the operation is normal.
	OFF	The power is off or fault occurs.
Link	ON	The ADSL link is up.
	Blinking	The ADSL link is starting up.
	OFF	The ADSL link is down.
Act	Blinking	Data is being transmitted and received on the ADSL link.
	OFF	No data transmission is present on the link.
USB	ON	The USB connection is established.
	OFF	No USB connection is present.
LAN1/2/3/4	ON	The Ethernet link is established.
	Blinking	Data is being transmitted and received on the Ethernet port.
	OFF	No link is present.
Diag	—	For manufactory test only.

1.2.2 Rear Panel

All ports of the DR814Q, a power port, and a reset button are located on the rear panel.

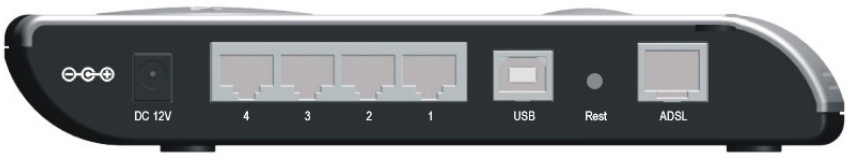


Figure 1-2 Rear view

Table 1-2 Description of the ports and reset button

Item	Quantity	Port	Description	Usage
Ethernet port	4	RJ45	10/100Base-TX 10/100 Mbps auto-negotiation auto-MDI/MDIX IEEE802.3/802.3u	Connect with the Ethernet port of a PC, Hub or switch.

Item	Quantity	Port	Description	Usage
USB port	1	Series-B Receptacle	USB 1.1	Connect with the USB port of a PC.
ADSL port	1	RJ11	ANSI T1.413 Issue 2 ITU G.992.1 AnnexA G.dmt ITU G.992.2 G.lite ITU G.992.3 ADSL2 ITU G.992.5 ADSL2+	Connect with the telephone jack on the wall or the ADSL port of a splitter.
Power port	1	—	—	Connect with the power adapter.
Reset button	1	—	—	Restore factory default settings (press and hold down the button for at least five seconds).

1.3 Features

DR814Q performs excellent network connection, featuring:

- Asymmetrical data transmission technology with downstream speed of 20 Mbps and upstream speed of 1 Mbps.
- Binding of an Ethernet port to a PVC, which enables you to access Internet services through different LAN ports.
- NAT (network address translation) technology that allows all PCs on a network to access the Internet sharing a single IP address.
- PPPoE dialup connection to the ISP.
- Capability of a DHCP (dynamic host configuration protocol) client to obtain a fixed IP address from an ISP or a dynamically assigned IP address.
- Capability of a DHCP server to assign IP addresses to hosts in a LAN or configure clients through the DHCP server.
- DNS relay that allows you to specify the IP address of an Ethernet port on the DR814Q as a DNS server IP address of a PC.
- DHCP relay that allows one DHCP server available for multiple DHCP clients in different network segments.
- ZIPB (zero installation PPP bridge), NAT, firewall, and IP filtering that secure your LAN.
- UPnP (Universal plug-and-play) for LAN users to use all the functions provided by UPnP-supported software (such as MSN) without any further configuration.
- IP routing, DNS (domain name system) configuration, and the services such as the IP and DSL performance monitoring.

- Friendly built-in Web-based graphical user interface for ease of configuration and management through common Web browsers.

2 Installation

On the assumption that you have acquired DSL services from your ISP, the following sections describe how to set up the DR814Q and configure your PC.

2.1 Packing List

Unpack the shipping carton carefully and check the following items listed in Table 2-1.

Table 2-1 Packing list

Item	Quantity
Aolynk DR814Q ADSL2+ Broadband Router	1
Power adapter	1
Telephone cable	1
Ethernet cable	1
USB cable	1
Set of screw and anchor	2
Aolynk DR814Q ADSL2+ Broadband Router Quick Start	1
CD including the user manual and driver	1
Warranty Card	1
Certificate of Quality	1

If anything is broken or missing, contact your agent for help.

2.2 Precautions

To guarantee normal operation and longevity of the DR814Q, its installation site should meet the requirements described below:

- Use the DR814Q indoors and keep it far away from the heat sources and water/liquid.

- Keep the cabinet or desk stable enough to hold the DR814Q. Fix the DR814Q and power adapter well on the wall when wall-mounting it.
- Reserve more than 10 cm (4 in.) of clearance around the DR814Q chassis for heat dissipation.
- Keep the operation environment clean. Dust buildup on the chassis may result in static absorption, reducing the life span and causing communication failure.
- Use an earthing system or lightning protection grounding different from that for the power supply equipment and keep them as far as possible.
- Keep the DR814Q far away from high-power radio launchers, radar launchers, and equipment with high-frequency and high-current.
- Wire the port cable indoors. Outdoor cabling is prohibited, to prevent the signal port from damages that may be caused by overvoltage and overcurrent from lightning strike.

2.3 Device Connection

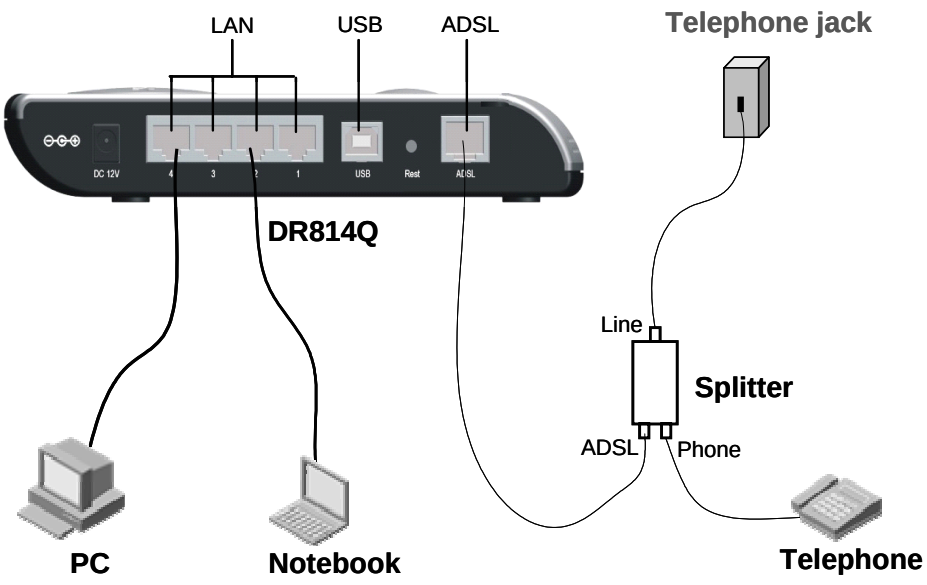


Figure 2-1 Connect the DR814Q

I. Connect to an ADSL line

To connect the DR814Q to an ADSL line, two options are available:

- Connect one end of the telephone cable to the ADSL port (similar to a common telephone port) on the DR814Q rear panel, and the other end to the telephone jack on the wall.
- As shown in Figure 2-1, connect both the ADSL port on the DR814Q and the telephone to a splitter, and then connect the splitter to the telephone jack on the wall. It allows you to use the telephone when you access the network.

II. Connect to a PC or Ethernet

To connect the DR814Q to a PC or Ethernet, two options are available:

- The Ethernet ports of the DR814Q are auto-MDI/MDIX, so you can use the crossover or straight-through cable to connect your PC, Hub, or switch to the Ethernet port (one among LAN1 through LAN4) of the DR814Q.
- Connect your PC to the DR814Q through the USB ports with a USB cable. It is suitable for the PC without NIC to access the Internet.

⚠ **Caution:**

To use the USB port on the DR814Q, you must install the USB driver and configure your PC (refer to section 8 “Appendix - USB Configuration” for detailed information).

III. Connect to the power adapter

Attach one end of the power adapter to the DR814Q and the other end to the power outlet. The DR814Q has no power switch, so it is powered on as soon as you plug the power adapter into the power outlet.

Approximately one minute after the power-on of the DR814Q, the states of the LEDs on the front panel should be those listed in Table 2-2.

Table 2-2 Description of the LED states

LED	State	Description
Power	Green	—
Link	Green	—
Act	Blinking	Data is being transmitted and received.
	OFF	No data transmission is present.
LAN	Green	The Ethernet link is established.
	Blinking	Data is being transmitted and received on the Ethernet port.

3 Getting Started

The DR814Q offers a series of Web configuration pages as the way to manage it. You can configure the DR814Q as needed. This chapter guides you to be familiar with the Web configuration pages.

3.1 Prerequisite Tasks for Configuration

To configure the DR814Q through its built-in Web pages, you must configure your PC as the following.

I. System requirements

- An Ethernet NIC (10Base-T or 10/100Base-T/TX) or a USB port
- A Web browser (Microsoft Internet Explorer 5.5, Netscape 6.0 or later)
- TCP/IP protocol employed

II. IP address of your PC

You must assign an IP address to your PC to make it in the same network segment as the DR814Q before accessing the configuration page. The default IP address of the DR814Q Ethernet port is 192.168.1.1. Refer to section 7 “Appendix - TCP/IP Protocol”.

III. No proxy server

If your PC uses the proxy server to access the Internet, you must disable the proxy service.

1) Choose [Tool/Internet options] to open the [Internet options] window.
2) Select the [Connections] tab and click <LAN settings…>.
3) Make sure the Use a proxy server option is not selected.

3.2 Login

Run your Web browser and enter **http://192.168.1.1** in the address bar. The login dialog box appears as shown in Figure 3-1.

Figure 3-1 Login dialog box

If this is your first login, type the default user name and password **admin**, and then click <OK> to enter the [Welcome] page as shown in Figure 3-2.

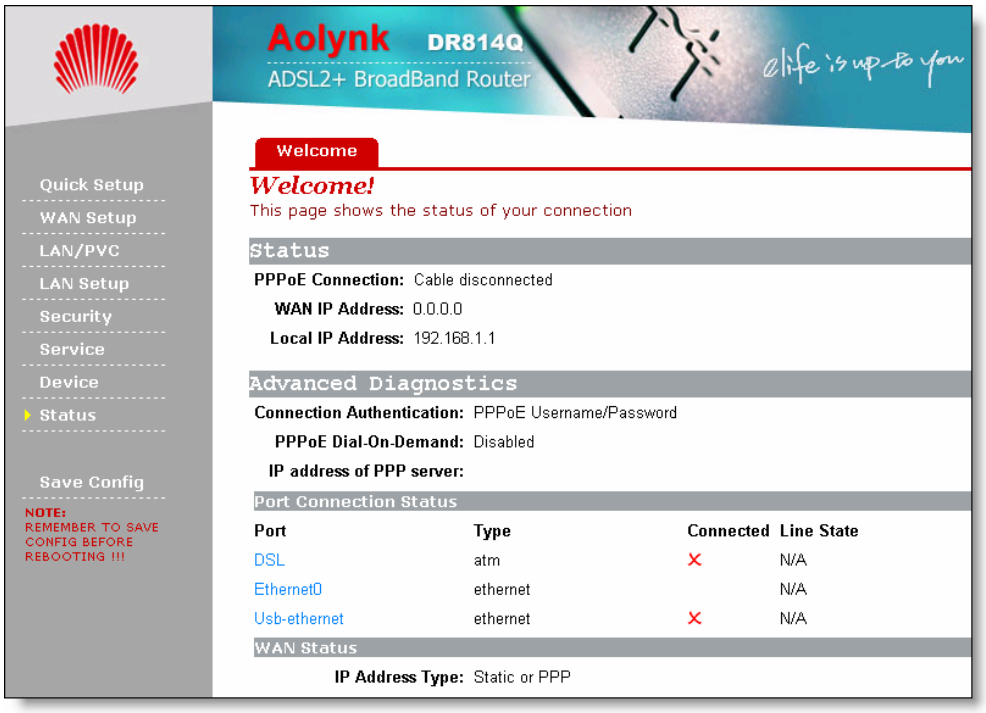


Figure 3-2 Welcome page

The left pane of the Web configuration page is the navigation bar and the right pane is the parameter setting section, where, when clicking a navigation button in the navigation bar, the corresponding parameter settings will appear.

🕮 **Note:**

- To change the login password, refer to section 4.4.1 “Password” for detailed information.
- If you receive an error message or the configuration page cannot be displayed, refer to section 6.1 “DR814Q Troubleshooting” for detailed instructions.

3.3 Description of the Factory Default Settings

The DR814Q is configured with factory default settings for SOHO users.

The table below lists some of the most important default settings and the subsequent chapters will cover all the features in detail. If you are familiar with network configuration, review these settings to verify that they meet the requirements of your network and follow the instructions to change them if necessary. If not, use the DR814Q with the default settings.

Table 3-1 Description of the factory default settings

Item	Default settings	Description
Default user name/password	Administrator: admin/admin Common user: user/user	You can log into the Web configuration page as an administrator or a common user. Different operation rights are available for different login users. Refer to 4.4.1 “Password” for detailed information.
IP address of the LAN port	Assigned static IP address: 192.168.1.1 Subnet mask: 255.255.255.0	This is the IP address of the DR814Q LAN port which connects the DR814Q to your Ethernet network. Generally, there is no need to change this address.
DHCP (dynamic host configuration protocol)	DHCP server enabled with the following pool of addresses: 192.168.1.2 to 192.168.1.51	The DR814Q provides a pool of private IP addresses for dynamic assignment to PCs in the LAN. To use this service, you must configure your PC to obtain an IP address dynamically. Refer to section 7.2.1 “Specifying to Obtain an IP Address Automatically”.
NAT (network address translation)	NAT enabled	Your PC’s private IP address is translated to the public IP address whenever it accesses the Internet. Refer to section 5.2.1 IV. “NAT configuration” for detailed information.
DSL mode	Multimode	Applicable to multiple standard DSL line modes.

4 Web-based Basic Configuration

This chapter describes the basic configuration pages of the DR814Q for SOHO users to implement its basic functions. For details of advanced configuration, refer to section 5 “Advanced Configuration”.

4.1 Quick Setup

Click [Quick Setup] in the navigation bar to enter the [Quick Start] page on which you can perform some simple settings to access the Internet quickly. Here, two common login types are available: PPPoE and DHCP.

I. PPPoE

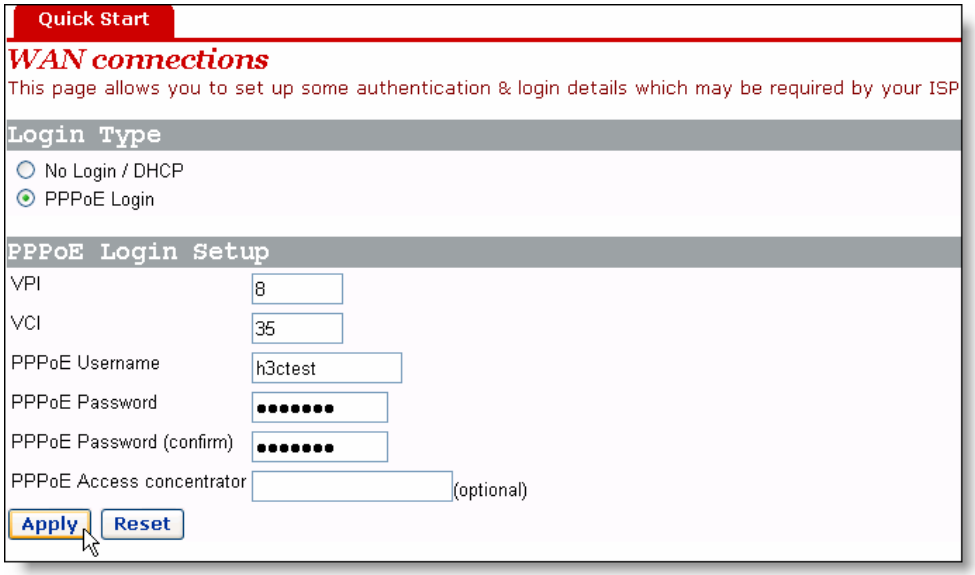


Figure 4-1 Quick Setup – PPPoE Login

The default login type on the page is PPPoE. This type requires you to type in the VPI and VCI values, PPPoE user name and PPPoE password specified by your ISP, and repeat the password for confirmation in the [PPPoE Password (confirm)] text box.

When there are multiple PPPoE servers in the network, you can specify the PPPoE server identifier through which the PPPoE client accesses in the [PPPoE Access concentrator] text box.

Click <Apply> after the configuration is complete.

II. DHCP

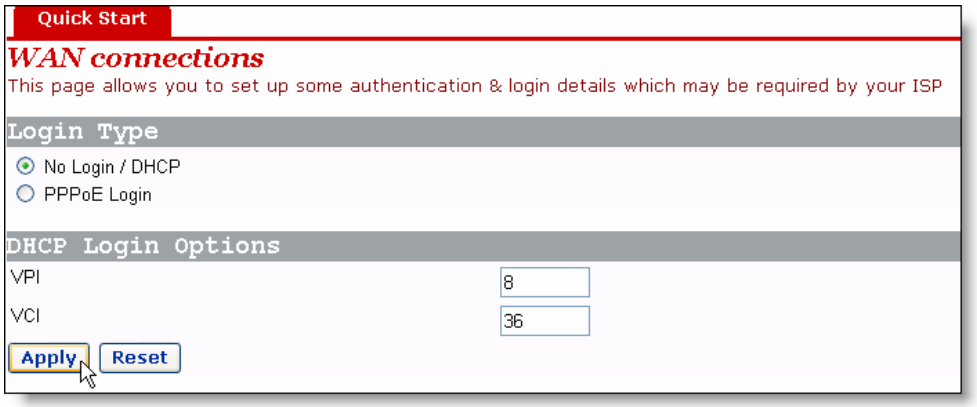


Figure 4-2 Quick Setup – No Login/DHCP

If you can obtain IP addresses from your ISP's DHCP server automatically, select the **No Login/DHCP** option on the [Quick Start] page (see Figure 4-1) and type in the VPI and VCI values specified by your ISP on the page (see Figure 4-2).

Click <Apply> after the configuration is complete.

⚠ **Caution:**

Do not set the same VPI and VCI values for DHCP and PPPoE login types.

4.2 WAN Setup

Click [WAN Setup] in the navigation bar to enter the corresponding page on which three tabs are available: WAN, DNS Relay, and DDNS. Click the desired tab to enter its configuration page.

4.2.1 WAN

This page allows you to set WAN connections in detail, or to modify the service attributes. You can access the Internet normally only when these attributes are set correctly.

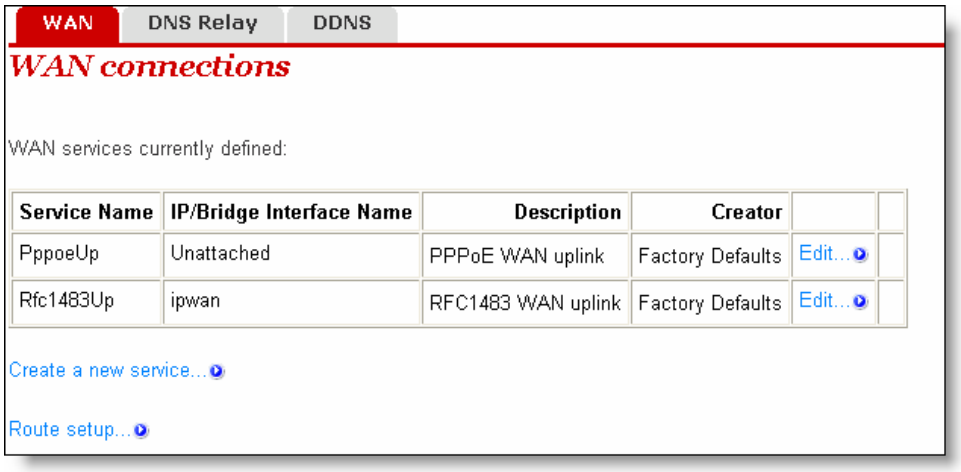


Figure 4-3 WAN

I. Create a new service

To create a new service, click <Create a new service…> to enter the [WAN connection: create service] page (see Figure 4-4).

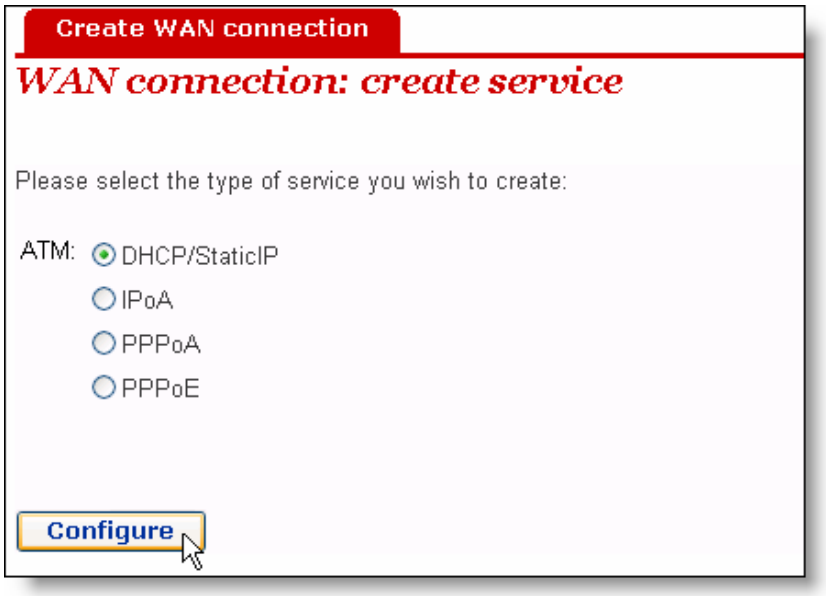


Figure 4-4 Create a WAN service

This page provides four modes for WAN connection: DHCP/StaticIP, IPoA, PPPoA and PPPoE. The following introduces their configurations respectively.

1) DHCP/Static IP

The IP address in this mode can be manually specified or automatically assigned by your ISP. The former requires you to manually specify the DNS server address on the [DNS Relay] page. For details, refer to section 4.2.2 “DNS Relay”.

To create a DHCP/Static IP WAN connection, select the **DHCP/StaticIP** option from the ATM mode list (see Figure 4-4), and then click <Configure> to enter the page (see Figure 4-5).

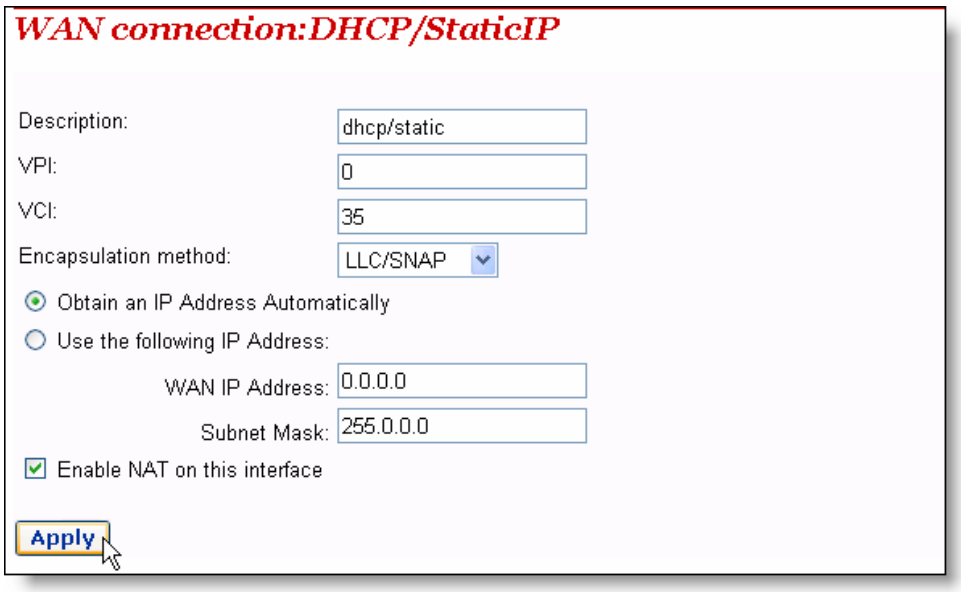


Figure 4-5 DHCP/Static IP

Table 4-1 Description of the DHCP/Static IP items

Item	Description
Description	Type in the distinctive description on this service.
VPI	Type in the VPI value provided by your ISP.
VCI	Type in the VCI value provided by your ISP.
Encapsulation method	Select the packet encapsulation method according to your ISP, LLC/SNAP or VcMux, from the drop-down lastly/SNAP is usually selected.
Obtain an IP Address Automatically	Select this option to obtain an IP address from your ISP's DHCP server automatically.
Use the following IP Address	Select this option if you have the static IP address provided by your ISP. You need also provide the IP address and subnet mask.
WAN IP Address	Type in the static IP address provided by your ISP.
Subnet Mask	Type in the subnet mask provided by your ISP.
Enable NAT on this interface	Select this check box to enable NAT. With it, SOHO users can make multiple hosts access network via a public IP address.

Click <Apply> after the configuration is complete.

2) IPoA

IPoA allows IP packets directly over the ADSL physical link at high transmission rate.

To create an IPoA WAN connection, select the **IPoA** option from the ATM mode list (see Figure 4-4), and then click <Configure> to enter the page as below.

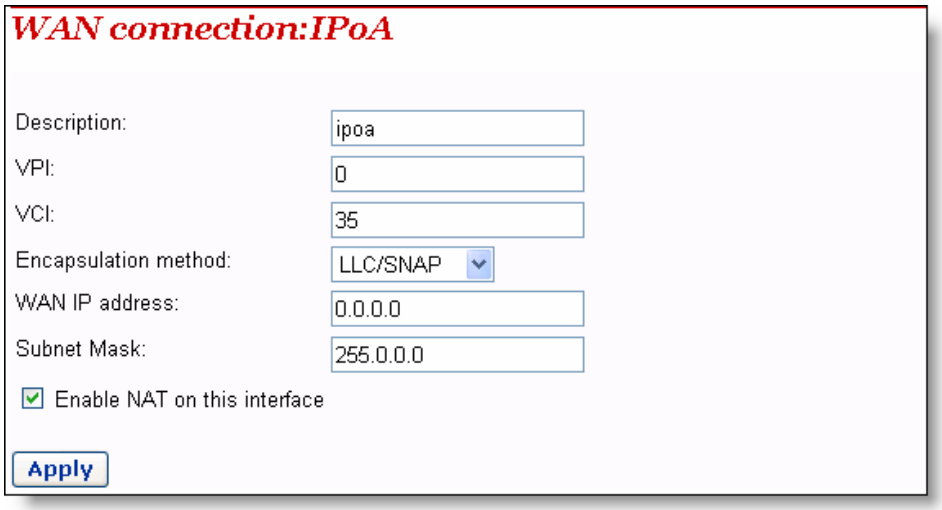


Figure 4-6 IPoA

Table 4-2 Description of the IPoA items

Item	Description
Description	Type in the distinctive description on this service.
VPI	Type in the VPI value provided by your ISP.
VCI	Type in the VCI value provided by your ISP.
Encapsulation method	Select the packet encapsulation method according to your ISP, LLC/SNAP or VcMux, from the drop-down lastly/SNAP is usually selected.
WAN IP Address	Type in the static IP address provided by your ISP.
Subnet Mask	Type in the subnet mask provided by your ISP.
Enable NAT on this interface	Select this check box to enable NAT. With it, SOHO users can make multiple hosts access network via a public IP address.

Click <Apply> after the configuration is complete.

3) PPPoA

To create a PPPoA WAN connection, select the **PPPoA** option from the ATM mode list (see Figure 4-4), and then click <Configure> to enter the page as below.

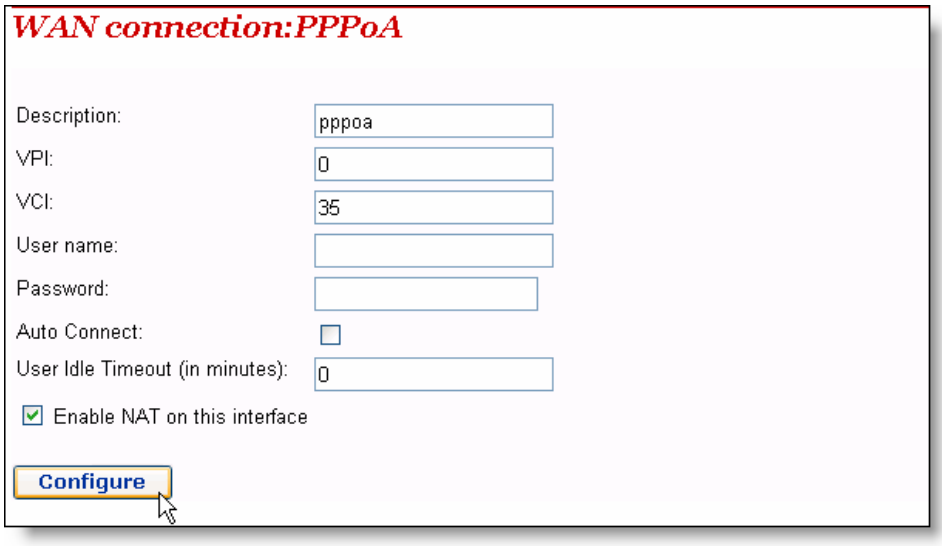


Figure 4-7 PPPoA

Table 4-3 Description of PPPoA items

Item	Description
Description	Type in the distinctive description on this service.
VPI	Type in the VPI value provided by your ISP.
VCI	Type in the VCI value provided by your ISP.
User nameUser name	Type in the user name provided by your ISP.
Password	Type in the password provided by your ISP.
Auto Connect	If this check box is selected, the device automatically performs the dialup connection again in response to a LAN access request when the network is disconnected.
User Idle Timeout	Type in the auto-disconnect idle time. Network connection is disconnected automatically in the case of no data transmission within the set time. This is suitable for time-based network accounting. If the time is set to 0, it indicates that the connection is never disconnected.
Enable NAT on this interface	Select this check box to enable NAT. With it, SOHO users can make multiple hosts access network via a public IP address.

Click <Configure> after the configuration is complete.

4) PPPoE

To create a PPPoA WAN connection, select the **PPPoA** option from the ATM mode list (see Figure 4-4), and then click <Configure> to enter the page as below.

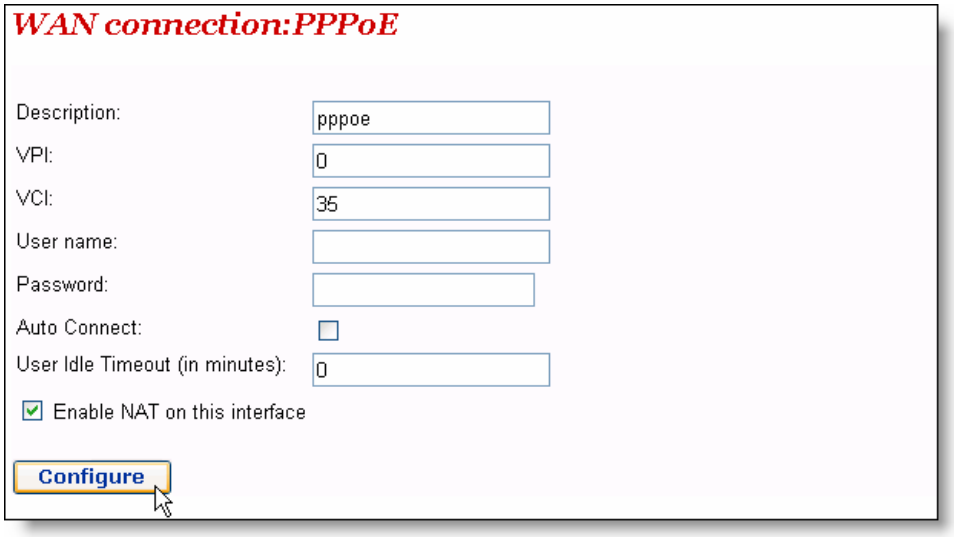


Figure 4-8 PPPoE

Table 4-4 Description of PPPoE items

Item	Description
Description	Type in the distinctive description on this service.
VPI	Type in the VPI value provided by your ISP.
VCI	Type in the VCI value provided by your ISP.
User name	Type in the user name provided by your ISP.
Password	Type in the password provided by your ISP.
Auto Connect	If this check box is selected, the device automatically performs the dialup connection again in response to a LAN access request when the network is disconnected.
User Idle Timeout	Type in the auto-disconnect idle time. Network connection is disconnected automatically in the case of no data transmission within the set time. This is suitable for time-based network accounting. If the time is set to 0, it indicates that the connection is never disconnected.
Enable NAT on this interface	Select this check box to enable NAT. With it, SOHO users can make multiple hosts access network via a public IP address.

Click <Configure> after the configuration is complete.

Caution:

Do not set the same VPI and VCI values for all services.

As shown in Figure 4-9, the service set up successfully will be added into the WAN service list.

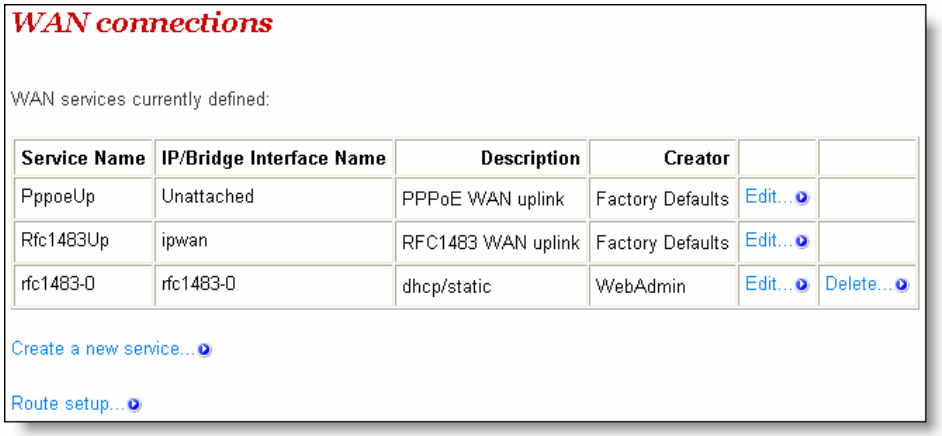


Figure 4-9 WAN service list

II. Edit a WAN service

To modify a service or perform advanced configuration, click the corresponding <Edit…> to enter the page. If necessary, modify the related values and then click <Change>.For details of the ATM Channel parameter configuration, refer to section 5.1 II. “QoS configuration”.

III. Delete a WAN service

To delete an existing WAN service, click the corresponding <Delete…> button to enter the page, and then click <Delete this connection>.

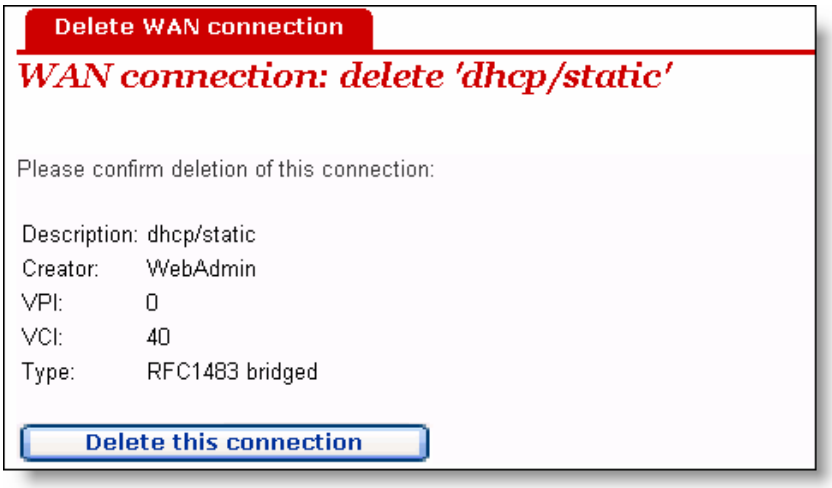


Figure 4-10 Delete a WAN connection

Caution:

The first two items in the WAN service list are default services and cannot be deleted.

4.2.2 DNS Relay

The DR814Q has the DNS relay function. Generally, the DNS server address obtained by your PC through DHCP is the IP address of the LAN port. You can also specify the DNS server address on your PC as the IP address of the LAN port. The DR814Q forwards the DNS query sent by your PC to the DNS server set on the DR814Q.

The configuration pages below are used to set the DNS server list. The DNS query sent by your PC is forwarded to the DNS server in the existing list. When your ISP changes the DNS server or you modify the connected ISP, there is no need to modify the IP address of the DNS server on your PC.

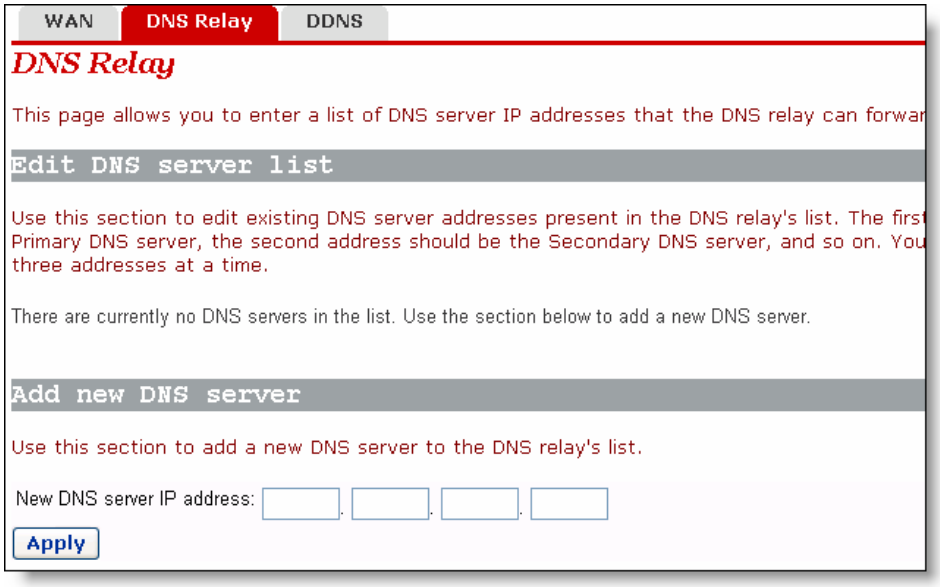


Figure 4-11 DNS Relay (1)

To create a new DNS server, type in its IP address, suppose 218.72.1.1, in the [New DNS server IP address] field, and then click <Apply>. This address will be added to the list of the DNS server IP address (see Figure 4-12).

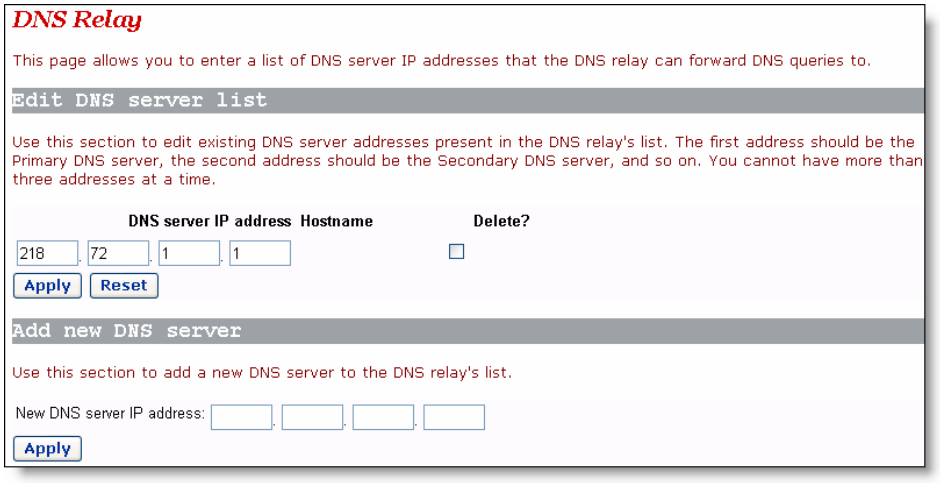


Figure 4-12 DNS Relay (2)

Caution:

In the list of DNS server IP addresses, the first address should be for the primary DNS server, the second for the secondary DNS server, and so on.

To modify the IP address of the DNS server in the list, modify it directly in the field and then click <Apply>.

To delete the existing DNS server, select the corresponding [Delete?] check box and then click <Apply>.

4.2.3 DDNS

Dynamic Domain Name Service (DDNS). By way of PPPoE or static IP, the IP address that the WAN port obtained is unfixed, making it inconvenient for the Internet users to access the LAN server. DDNS solves this problem. After you set the DDNS function, the DR814Q update the mapping between the domain name and the IP address automatically, ensuring the Internet users to access the LAN through the domain name.

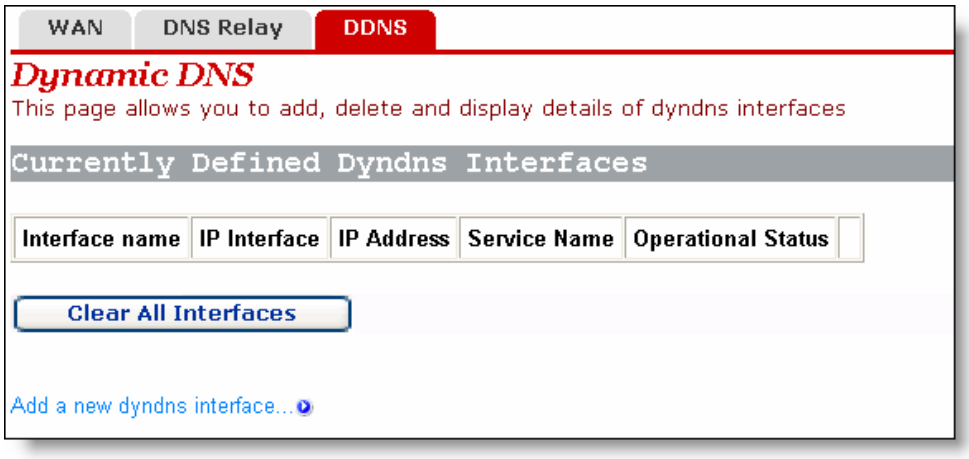


Figure 4-13 Dynamic DNS configuration (1)

Click <Add a new dyndns interface…> to enter the DDNS configuration page (see Figure 4-14).

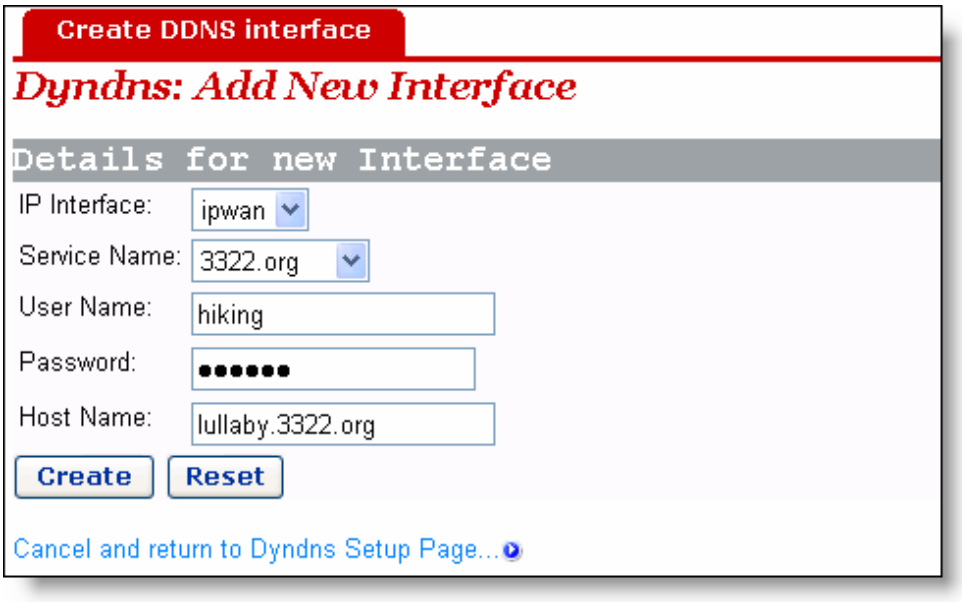


Figure 4-14 Dynamic DNS configuration (2)

Table 4-5 Description of the DDNS items

Item	Description
IP interface	Select the interface on which you want to enable the DDNS function.
Service Name	Select the web site where to obtain the DDNS service.
User Name	Type in the user name you register with the DDNS server.
Password	Type in the password you register with the DDNS server.
Host Name	Type in the domain name you apply from the DDNS server.

Note:

As the client tool of the DDNS service, the DDNS function must cooperate with the DDNS server. Visit **www.3322.org**, www.dyndns.org or **www.tzo.com** to apply for a domain name before you enable the DDNS function. After you complete the DDNS settings on the DR814Q, the mapping between the domain name and the IP address of the WAN port is established.

Example: If you have applied for the domain name lullaby from **www.3322.org**, see Figure 4-14 for the settings to make the mapping between the domain name and the IP address of the WAN port on the DR814Q. Click <Create> and you can view the DDNS configurations as below.

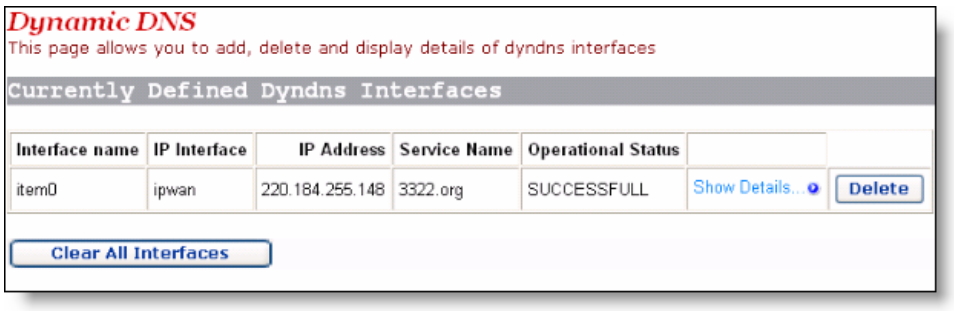


Figure 4-15 DDNS configuration succeeds

To delete the DDNS configuration, click <Delete>. To clear all the DDNS configuration, click <Clear All Interfaces>. To view the detailed configuration of the current DDNS interface, click <Show Details…>.

4.3 LAN Setup

Click [LAN Setup] in the navigation bar to enter the corresponding page where three tabs are available: LAN, DHCP Server, and DHCP Relay. Click any tab to enter your desired configuration page.

4.3.1 LAN

This page allows you to set attribute values for the Ethernet port and to configure virtual interfaces.

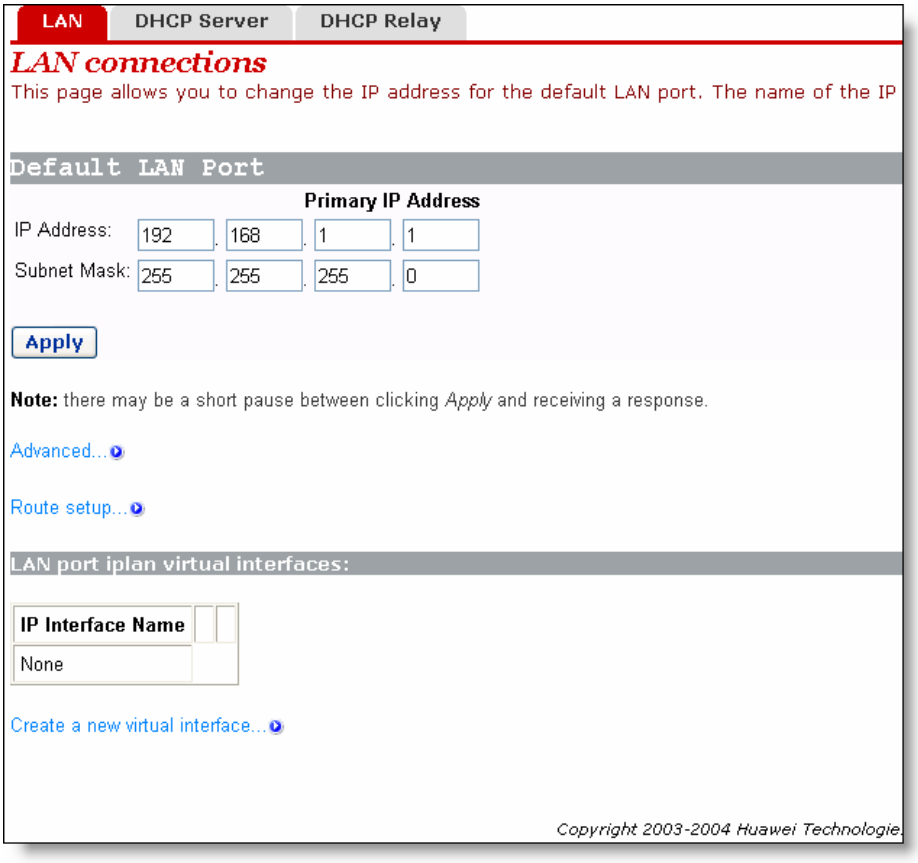


Figure 4-16 LAN connections

I. Set a LAN port

To change the IP address of the LAN port, type in the IP address and/or subnet mask directly in the corresponding field, and then click <Apply>.For related introduction to the IP address, refer to section 9 “Appendix - IP Address and Subnet Mask”

To perform advanced configuration on the attribute of LAN port, click <Advanced…> to enter the [Edit iplan] page as shown in Figure 4-17.If necessary, modify the values of options and click <Change>.

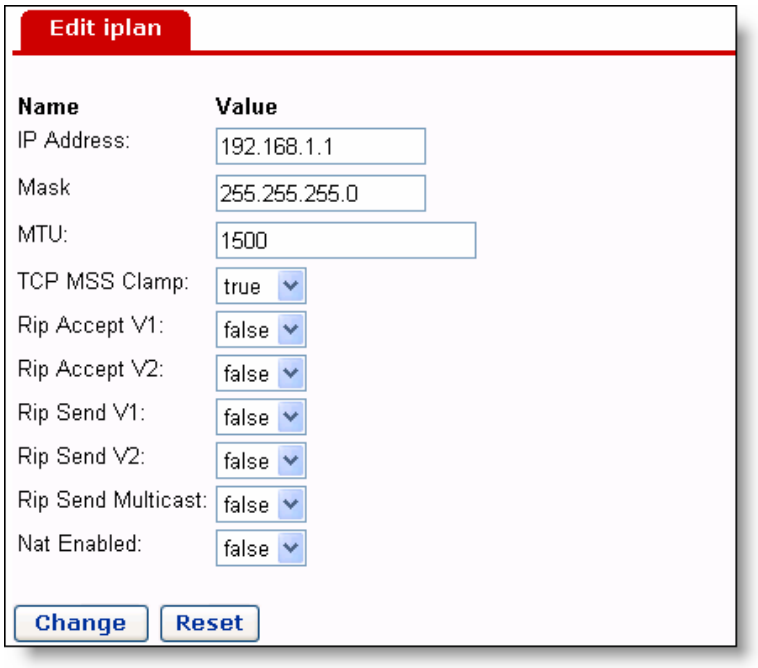


Figure 4-17 Modify the iplan interface

II. Create a new virtual interface

To create a new virtual interface, click <Create a new virtual interface…> on the [LAN connections] page (see Figure 4-16) to enter the page as below.

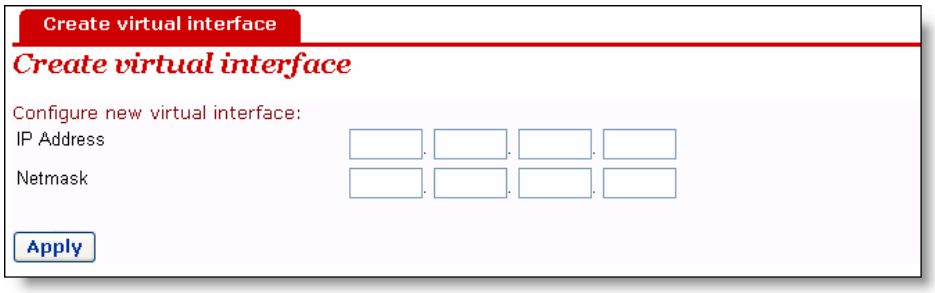


Figure 4-18 Create a virtual interface

Type in the IP address and subnet mask (you cannot configure the IP address of the virtual interface and that of the LAN port to be in the same subnet) and click <Apply>. The information on this virtual interface is displayed on the page as below.

Figure 4-19 Virtual interface

The created virtual interface can be used for DMZ configuration. For details, refer to section 5.3 "DMZ Configuration".

To modify the information on the current virtual interface or perform advanced configuration, click the corresponding <Edit…> button to enter the page. If necessary, modify the values of options and click <Change>.

To delete the current virtual interface, click the corresponding <Delete…> button to enter the page, and then click <Delete this connection…>.

4.3.2 DHCP Server

The DR814Q can act as a DHCP server to automatically assign IP addresses within a certain range to any PC running in the LAN.

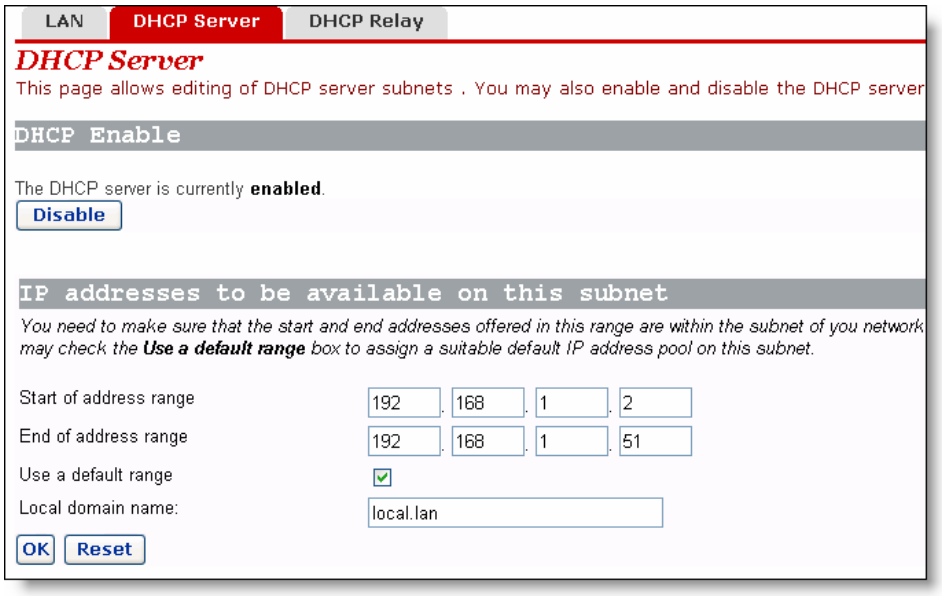


Figure 4-20 DHCP Server

I. Enable/disable the DHCP server

If the DHCP server is disabled currently, you can click <Enable> to enable it. Conversely, you can also click <Disable> to disable the DHCP server.

II. Set a DHCP server

The enabled DHCP server can assign the IP addresses, according to the defined address range on this page, to the DHCP client sending a request. It is recommended that you select the [Use a default range] check box to assign a suitable default IP address pool for the current subnet.

If necessary, you can also set the DHCP address range manually. In this case, do not select the [Use a default range] check box (by removing the tick). Type in the start and end IP addresses in the corresponding fields, and then click <OK>.

If necessary, you can type in commonly used DNS suffixes such as **google.com** in the [Local domain name] text box. Thus, you can access the Google homepage by entering **http://www/** in the Web browser. Small and medium-sized enterprises can also set their own DNS suffixes here while home users need not.

4.3.3 DHCP Relay

The DR814Q has the DHCP relay function to transmit packets between the DHCP client and server in different network segments, thereby making the DHCP client on multiple networks use the DHCP server across these segments.

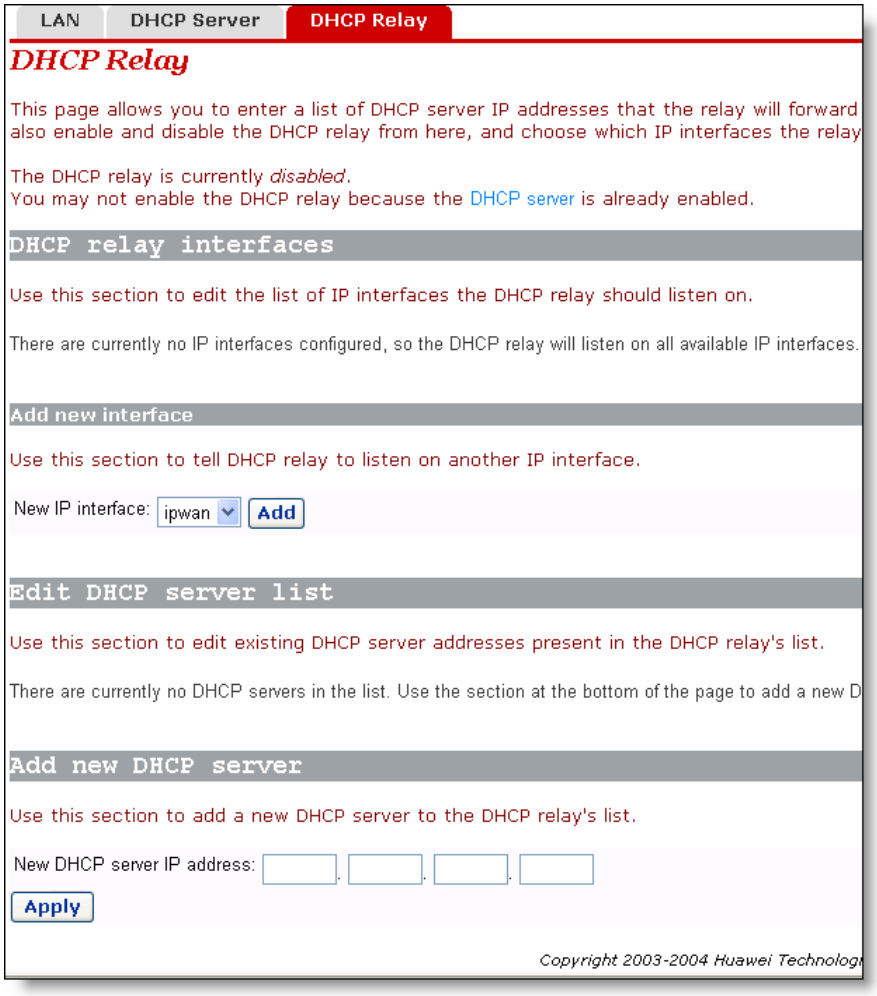


Figure 4-21 DHCP Relay page

I. Specify a DHCP relay interface

On the [DHCP Relay] page (see Figure 4-21), select an interface (suppose iplan) from the [New IP interface] drop-down list to apply the DHCP relay function, and then click <Add>. This interface will appear on the page as below.

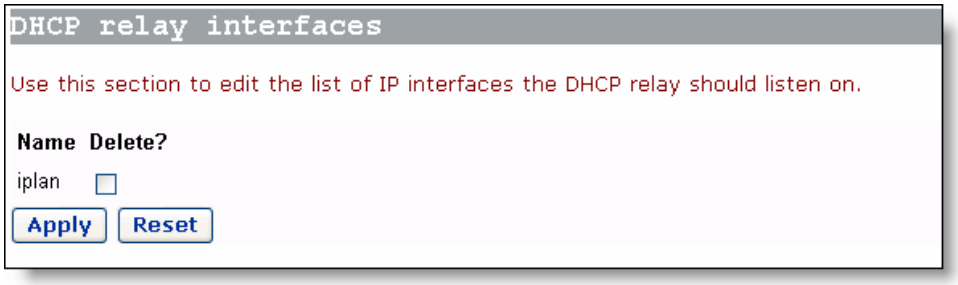


Figure 4-22 New IP interface

Click <Apply> in Figure 4-22 to apply this configuration, and the “Changes successfully applied” information appear on the page as below.

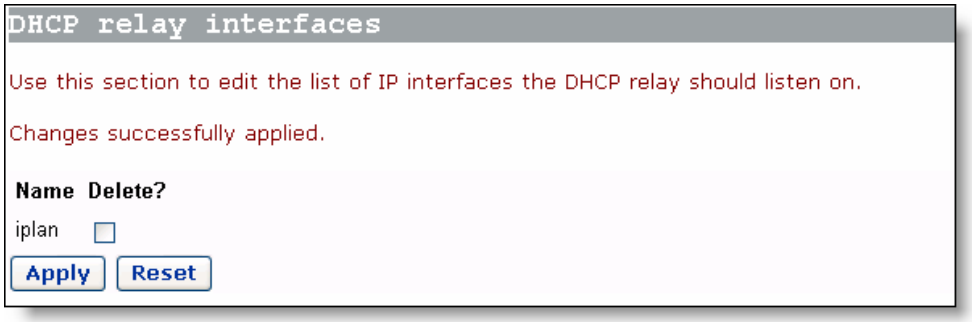


Figure 4-23 The applied new IP interface

Follow the above instructions to specify other interfaces.

To delete this interface, select the corresponding [Delete?] check box and click <Apply>.

Caution:

- You should configure two interfaces (sending and receiving packets respectively) of DHCP relay in pair. For example, to set the host connected to the LAN port to communicate with the DHCP server on the WAN side, you need to configure the iplan and ipwan to be the DHCP relay interfaces concurrently.
- If no interface is specified, the DR814Q enables the DHCP relay function on all interfaces by default.

II. Set a DHCP server

To add a DHCP server, type in the IP address (suppose 20.2.0.100) of the DHCP server in the [New DHCP server IP address] field (see Figure 4-21). This address will be added to the list of DHCP server IP addresses as below.

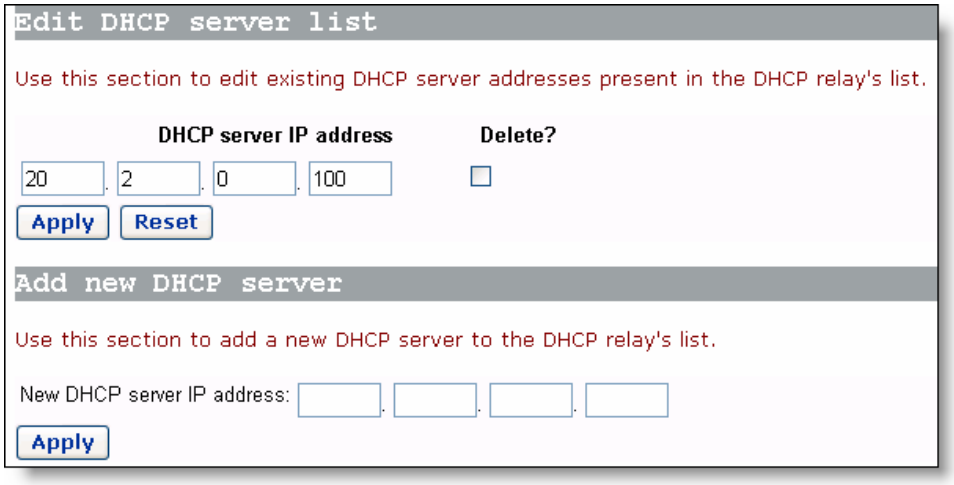


Figure 4-24 Set a DHCP server

To modify the IP address of the DHCP server in the list, modify it directly in the field and then click <Apply>.

To delete the existing DHCP server, select the corresponding [Delete?] check box and then click <Apply>.

III. Enable/disable DHCP relay

You need to enable the DHCP relay function after the configuration is complete. The functions of DHCP server and DHCP relay of the DR814Q cannot be enabled concurrently. By default, you cannot enable the DHCP relay because the DHCP server is already enabled. The prompt is display as shown in Figure 4-21.

Click <DHCP Server> on the above page (see Figure 4-24) to enter the DHCP server page, click <Disable> and thus <Enable> appears on the page (see Figure 4-25). If the DHCP relay is disabled currently, you can click <Enable> to enable it. Conversely, click <Disable> to disable it.

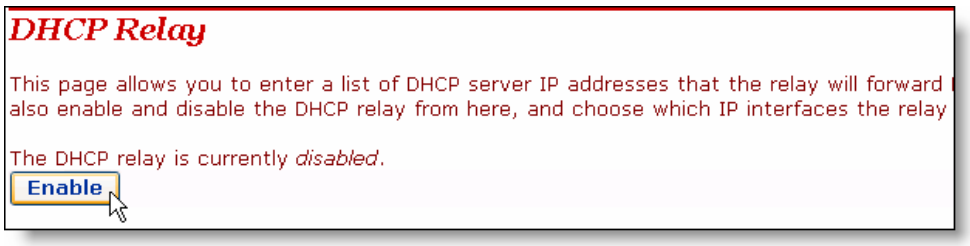


Figure 4-25 Enable/disable the DHCP relay

Caution:

To ensure the DHCP relay to be effective, you need to disable NAT between the specified interface and the interface corresponding to the network where the DHCP server resides. For example, to specify the host connected to the LAN port to communicate with the DHCP server on the ipwan interface, you must disable NAT between the internal interface (iplan) and the external interface (ipwan).

4.4 Device

Click [Device] in the navigation bar to enter the corresponding page where five tabs are available: Password, Remote, Restart, Backup and Upgrade. Click any tab to enter your desired configuration page.

4.4.1 Password

You can access log into the Web configuration page of DR814Q via two user name: admin and user. The administrator has the maximum rights while the common user can only access part of the configuration pages. Only the administrator can enter the following [Password] page to change the login passwords for two users. The common user can only change its own password.

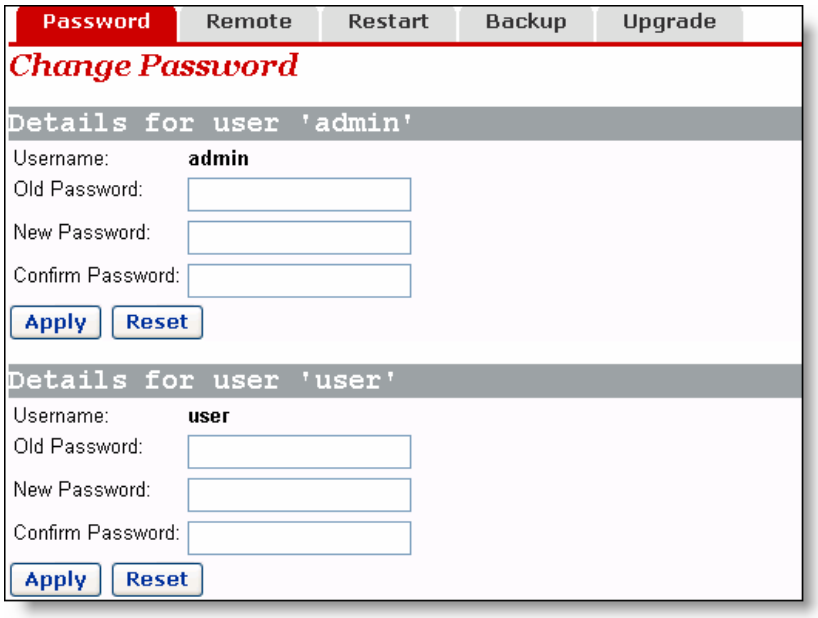


Figure 4-26 Change the password

By default, admin and user are the passwords for administrator and common user respectively.

To change the password, type in the related information in the [Old Password], [New Password] and [Confirm Password] text boxes, and then click <Apply>.

4.4.2 Remote Access

If remote access is enabled, you can view the current configuration page and manage the DR814Q remotely.

By default, the remote access is enabled and the idle timeout time is set to 0 (see Figure 4-27). In this case, remote access is kept alive.

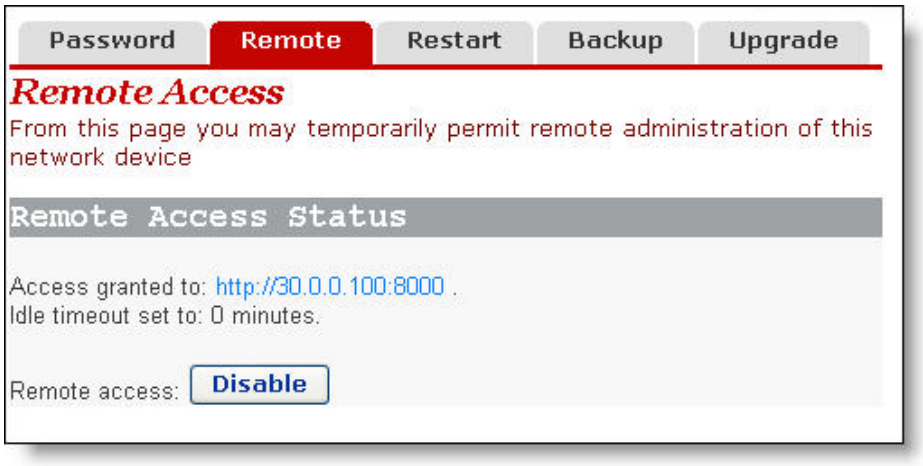


Figure 4-27 Remote access page – remote access enabled

Figure 4-27 indicates the port for remote management is 8000, so you can manage the DR814Q remotely by entering **http://xxx.xxx.xxx.xxx:8000** in your Web browser. The xxx.xxx.xxx.xxx is the IP address of the WAN port on the DR814Q. If multiple WAN services are configured and all of them obtain the IP addresses, the IP address of any service can be used for remote access.

To disable the remote access, click <Disable> on the [Remote Access] page to open the page as below.

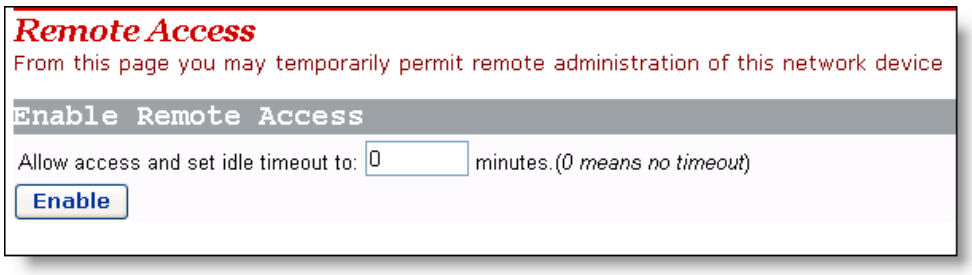


Figure 4-28 Remote access page – remote access disabled

In this case, you can set the idle timeout time to a desired value other than 0 in the text box on the page. Thus, when you click <Enable> to enable the remote access next time,

the DR814Q tracks the elapsed idle time and terminates the remote connection to avoid remote attacks when the elapsed idle time exceeds the set idle time.

Caution:

A remote connection is maintained only when the idle timeout time is set to 0. If you set the timeout time to another value, remote access is disabled automatically whenever the DR814Q restarts.
Because remote access is enabled by default, you need to configure the password to prevent network invasion by the Internet users.

4.4.3 Restarting/Restoring Factory Default Settings

This page allows you to restart the DR814Q, or reset all configurations to factory default settings.

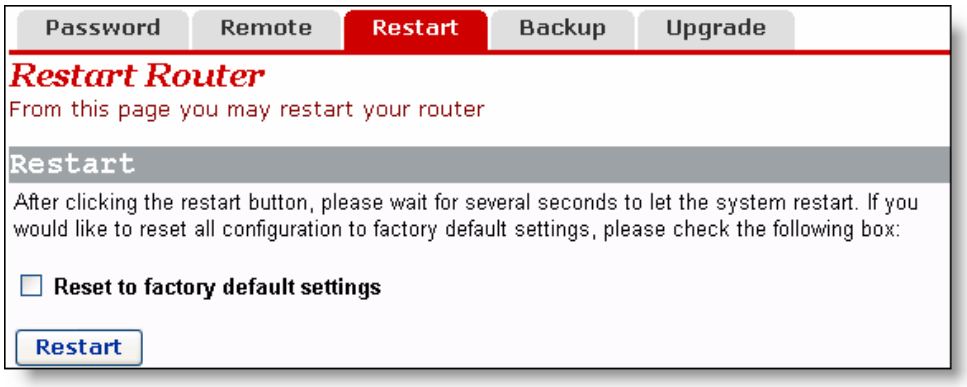


Figure 4-29 Restart Router page

To restart the DR814Q, click <Restart>.

To reset all configurations to the factory default settings, select the [Reset to factory default settings] check box and click <Restart>.

Caution:

It may take several seconds to restart the DR814Q.

4.4.4 Backing Up/Restoring Configuration

This page allows you to back up the current configuration to your PC, or restore the configuration from a previously saved file.

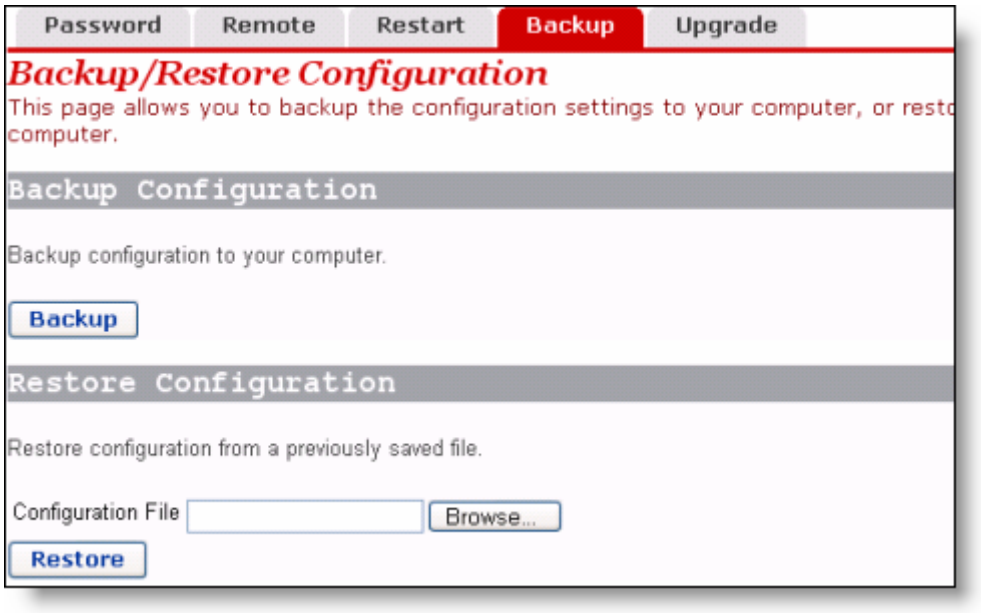


Figure 4-30 Backup/Restore Configuration page

I. Back up the current configuration

Click <Backup> to open the [File Download] dialog box as below.

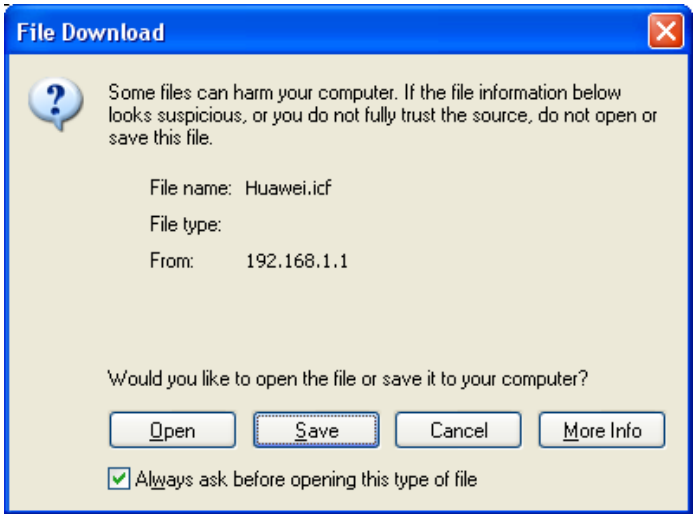


Figure 4-31 File Download dialog box

Click <Save> to open the [Save As] window as below.

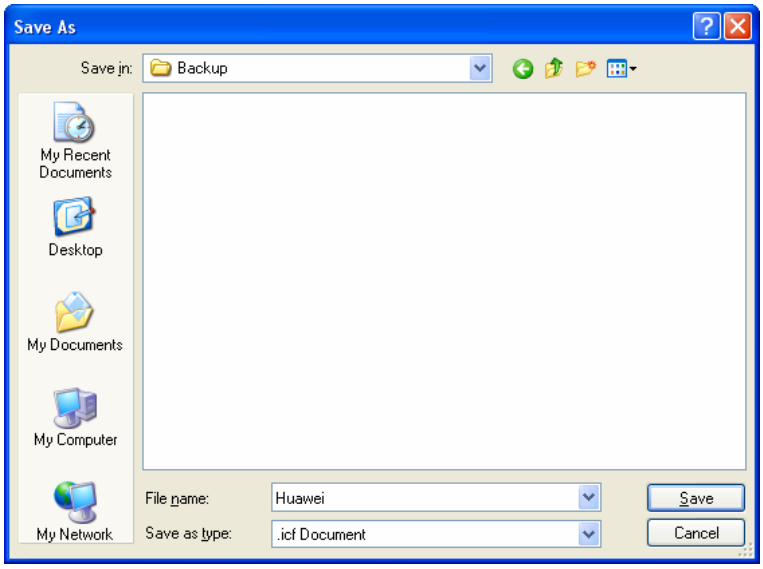


Figure 4-32 Save the configuration file

Select a directory to save the file and type in a valid file name (with the .icf suffix), and then click <Save> to back up the current configuration to the file.

II. Use the file to restore the configuration

To use the previously saved file to restore the configuration, click <Browse…> in Figure 4-30 to open the [Choose file] window as below.

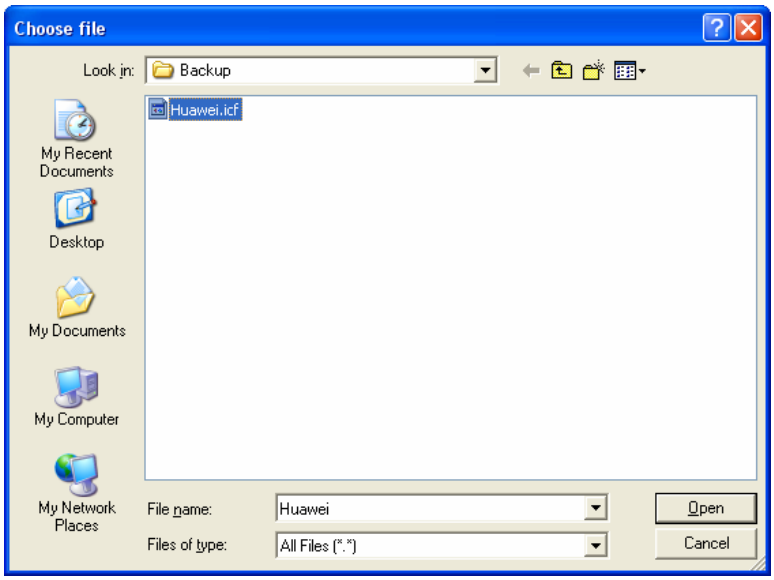


Figure 4-33 Choose the backup file

Find the configuration file and then click <Open> to open the page as below. Click <Restore> to use the file to restore the configuration.

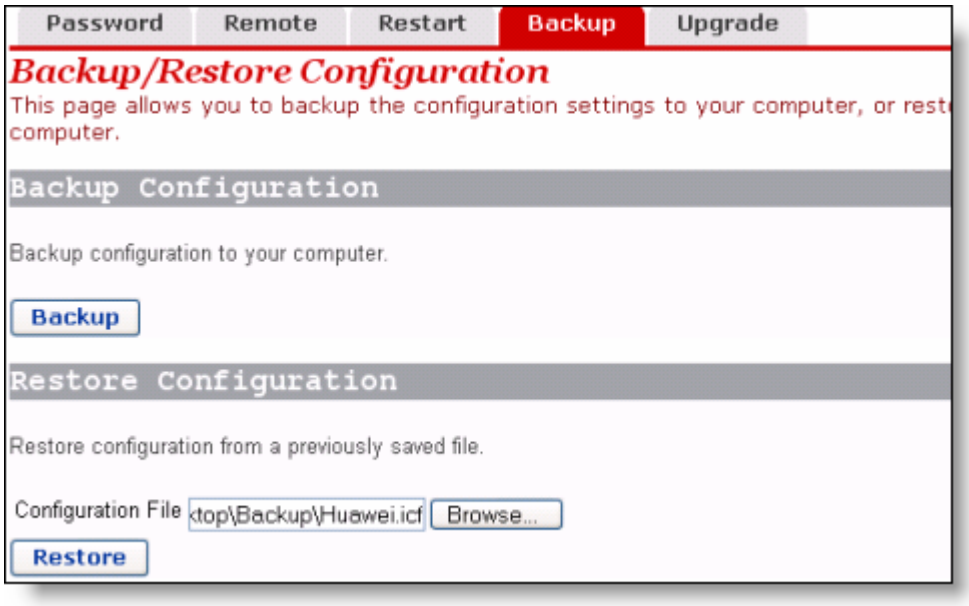


Figure 4-34 Restore the configuration

4.4.5 Upgrade

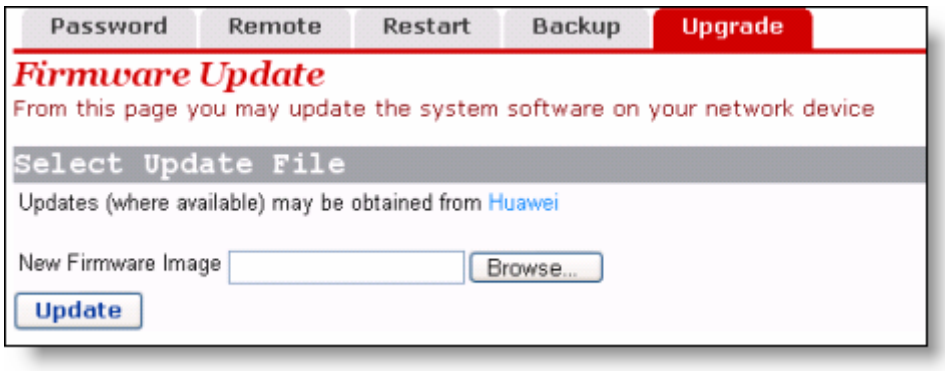


Figure 4-35 Software upgrade

This page allows you to upgrade the software of the DR814Q.Type in the local path of the software update file downloaded from Huawei technical support website, or click <Browse…> to select this file on your PC and then click <Update>.

During the update, a progress bar appears on the page as below.

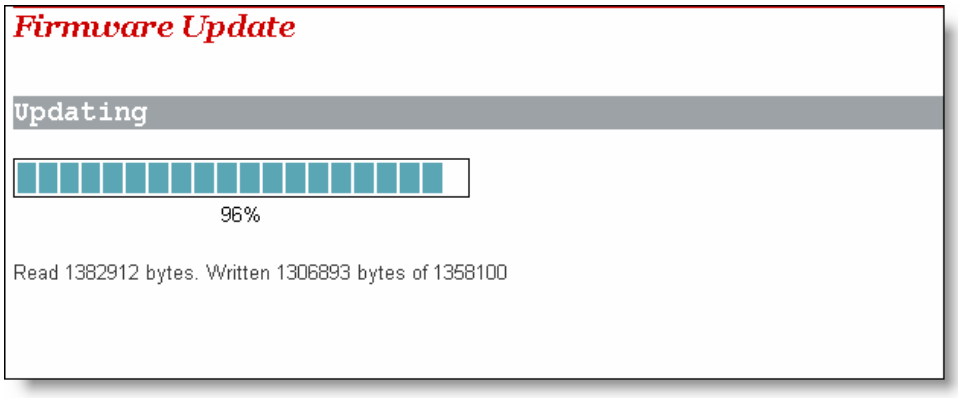


Figure 4-36 Update progress

Figure 4-37 shows that the update is complete. Now, you need to restart the DR814Q by clicking <Restart>.

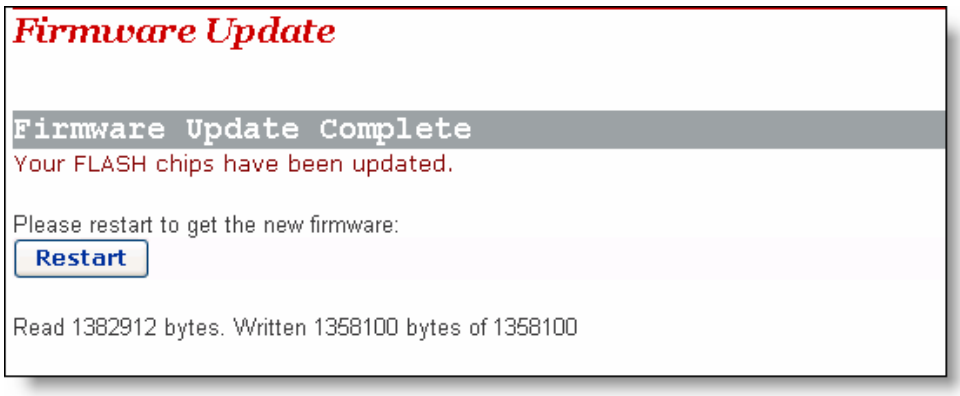


Figure 4-37 Complete the update

⚠ **Caution:**

After the upgrade and restart, you need to restore factory default settings to ensure the normal configuration.

Click <Huawei> to access Huawei technical support website to obtain the latest software version.

4.5 Status

Click [Status] in the navigation bar to enter the corresponding page where three tabs are available: Status, Log, and Search Service. Click any tab to enter your desired configuration page.

4.5.1 Status

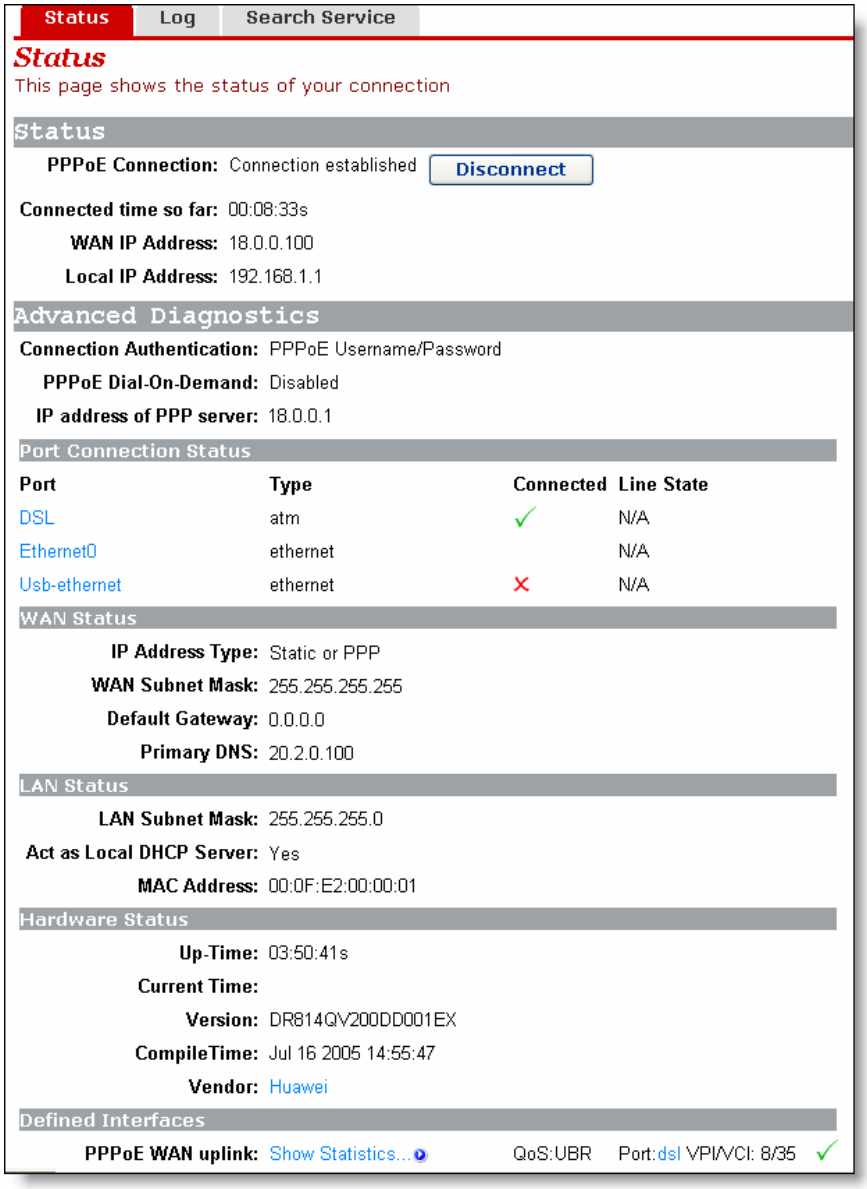


Figure 4-38 Status configuration page

This page displays useful information about the configuration of the DR814Q, including:

- Details of network connection
- Some important system information (hardware and version information)
- Routing table
- Connection status of current DSL, Ethernet and USB port
- WAN port status
- LAN port status
- Statistics on all interfaces

4.5.2 Log

This page records all types of events occurring during the running of the DR811/814.

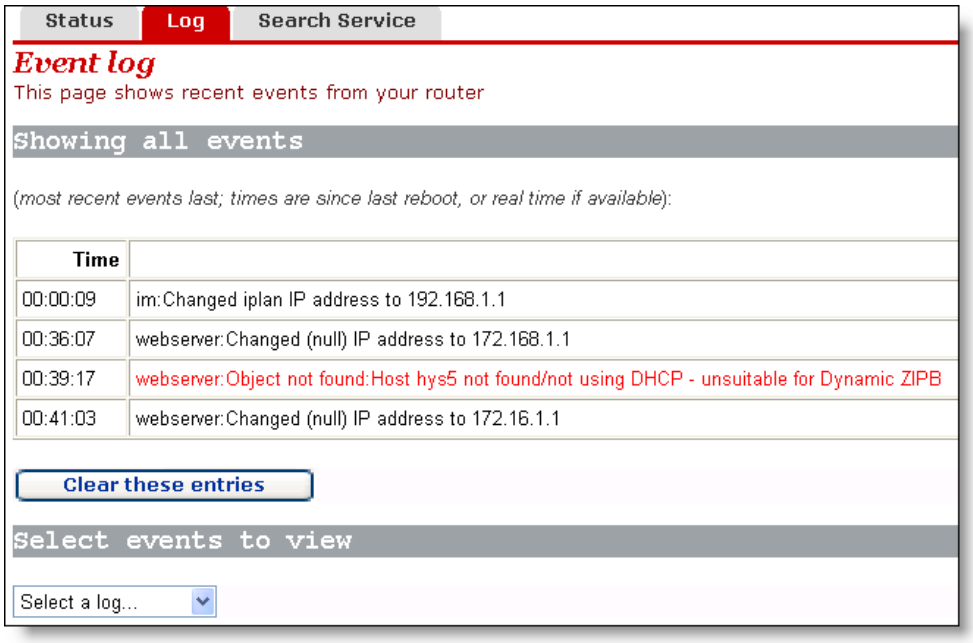
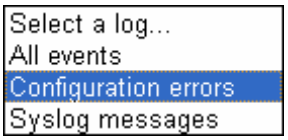


Figure 4-39 Log

The drop-down list in the [Select events to view] section includes the options as shown in the figure below. Select an event type to view the corresponding event information.



Click <Clear these entries> to clear the currently displayed events.

4.5.3 PVC Search

The [Edit Scan PVC] page allows you to search the currently unused PVC settings. If your ISP has configured PVC services within the searchable range, after the search, these PVC services will be automatically configured to the service list on the [WAN Connections] page until the number of services reaches eight in this list.

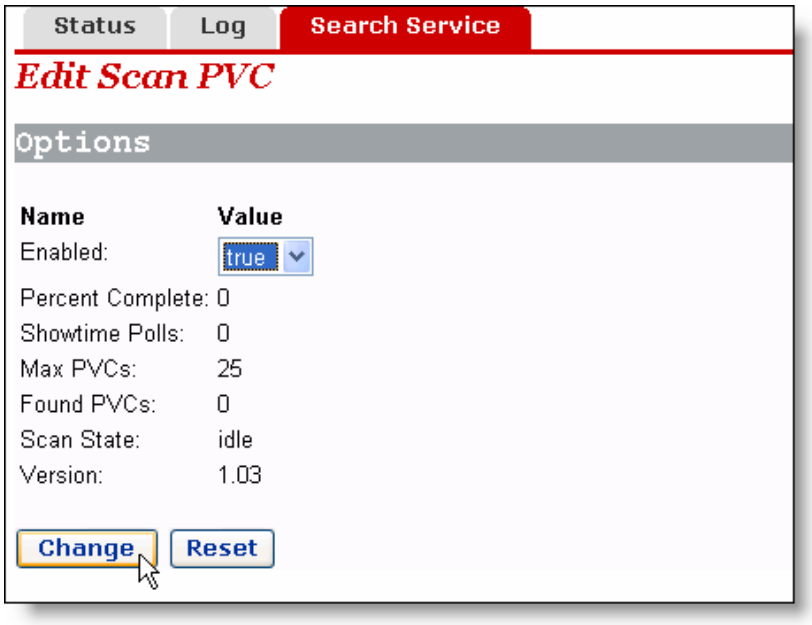


Figure 4-40 PVC Scan page

Select the **true** option from the drop-down list in Figure 4-40, and then click <Change> to start the search. It may take about five minutes.

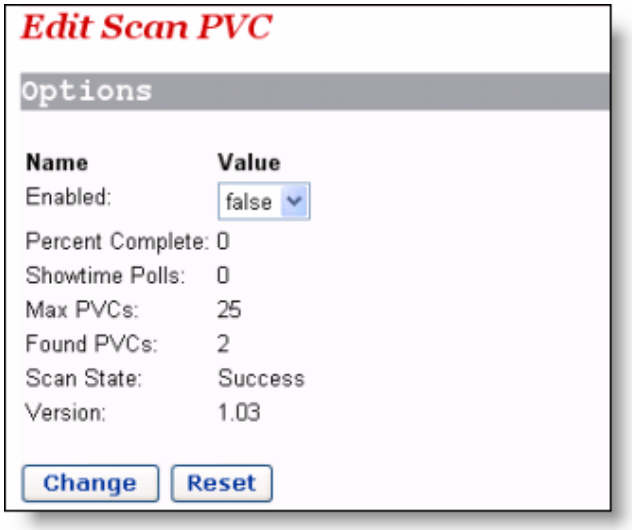


Figure 4-41 Search PVC

As shown in Figure 4-41, two PVCs are found. Click [WAN Setup] in the navigation bar, you will find that two services found by the DR814Q are automatically added to the WAN service list as below.

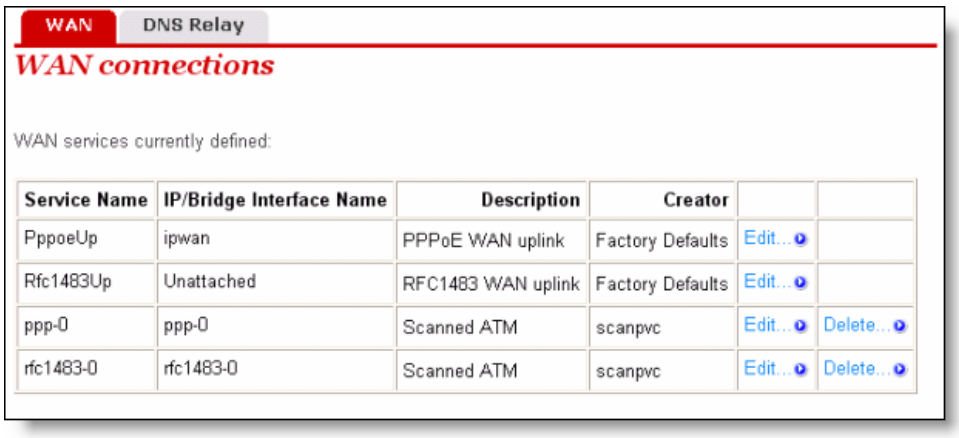


Figure 4-42 Add the found services automatically

If the PPPoE or PPPoA service is found, you need to edit these automatically added services by typing in a user name and a password.

4.6 Save the Configuration

Enter the [Save configuration] page after all the configurations are complete. Click <Save> to save your configurations so that they take effect when the DR814Q restarts.

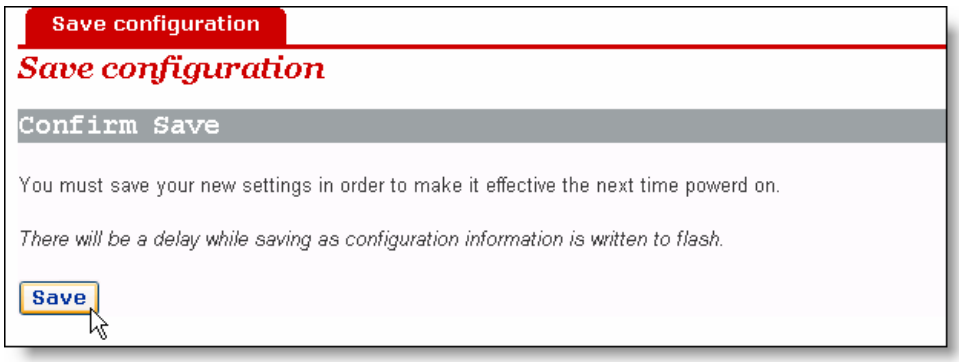


Figure 4-43 Save the configuration

Caution:

Do save your settings, otherwise, they will be lost after the DR814Q restarts.

---

5 Advanced Configuration

After you complete the proceeding configuration correctly, the DR814Q can access all Internet services. This chapter introduces how to configure the advanced functions of the DR814Q to enhance the performances, thereby satisfying various demands on network configuration.

5.1 Binding LAN Ports to PVCs

Click [LAN/PVC] to enter the [Attachment Setting] page. You can bind the Ethernet port to a PVC and set the corresponding QoS parameters for PVC.

I. PVC Binding Settings

With the PVC binding function, you can bind any of the four Ethernet ports (LAN ports) to any of the four upstream PVCs. Each PVC bridges data from the bound Ethernet port to the broadband access server (BAS) to accommodate different Internet services through different Ethernet ports. Services such as the Internet accessing, video-on-demand (VOD), and IPTV carried out by different access servers improve security and stability of the system and ease the load of BASs remarkably.

You can also configure an Ethernet port as a management port to manage devices. You can access the configuration management page of your DR814Q through a host that is connected to the management port. By default, the four LAN ports of the DR814Q are all the management ports.

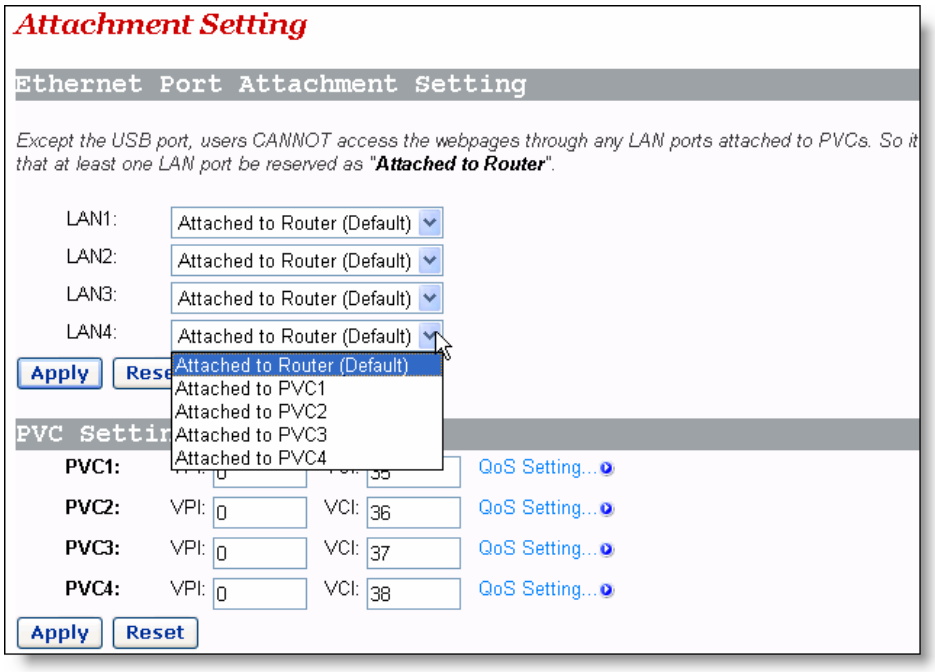


Figure 5-1 PVC Binding Settings

As Figure 5-1 shows, there are five options for each Ethernet port (LAN1 to LAN4) in the drop-down list: Attached to PVC1/2/3/4 and Attached to Router (Default).

Upon the configuration of these LAN ports, you need to click <Apply> to save your configuration and have it take effect. Then in the [PVC Setting] section set VPIs/VCIs for the corresponding PVCs. Values of VPI/VCI are provided by your ISP. Click <Apply> in this section to save your configuration.

⚠ **Caution:**

- You can manage your DR814Q only through the PC connected to the management port or the USB port.
- If all the four Ethernet ports are configured to be bound to PVCs, you can still access the configuration management page through the USB port. Refer to section 8 “Appendix - USB Configuration” for more information about the USB port.
- The VPI/VCI values of different PVCs cannot be identical with each other or the same as those on the other configuration pages.

The following example illustrates the configuration upon the assumption:

- Bind a LAN port to PVC 0/35 to access the IPTV Website that your ISP set up. The Website uses DHCP to assign IP addresses dynamically.

- Bind other two LAN ports to PVC 0/100, and the PCs connecting to these ports access the Internet through PPPoE dial-up connections.
- Route the last LAN port to access the Internet and apply NAT-enabled PPPoE service on this port. Bind it to PVC 8/35. The user name and password your ISP assigns are **username** and **myPassword** respectively.

Follow these steps to achieve the settings on your DR814Q.

1) On the [Ethernet Port Attachment Setting] page (see Figure 5-2), select the **Attached to PVC1** option from the LAN1 drop-down list to bind LAN1 to PVC1 and bind LAN2 and LAN3 to PVC2 in the same way. Leave the LAN4 default setting **Attached to Router** untouched. Click the <Apply> to save your configuration.
2) In the [PVC Setting] section, set **0/35** as the VPI/VCI value of PVC1, **0/100** as that of PVC2.Click <Apply> in the [PVC Setting] section to save your settings. Since you do not use PVC3 and PVC4 here, there is no need to specify VPI/VCI values for them.

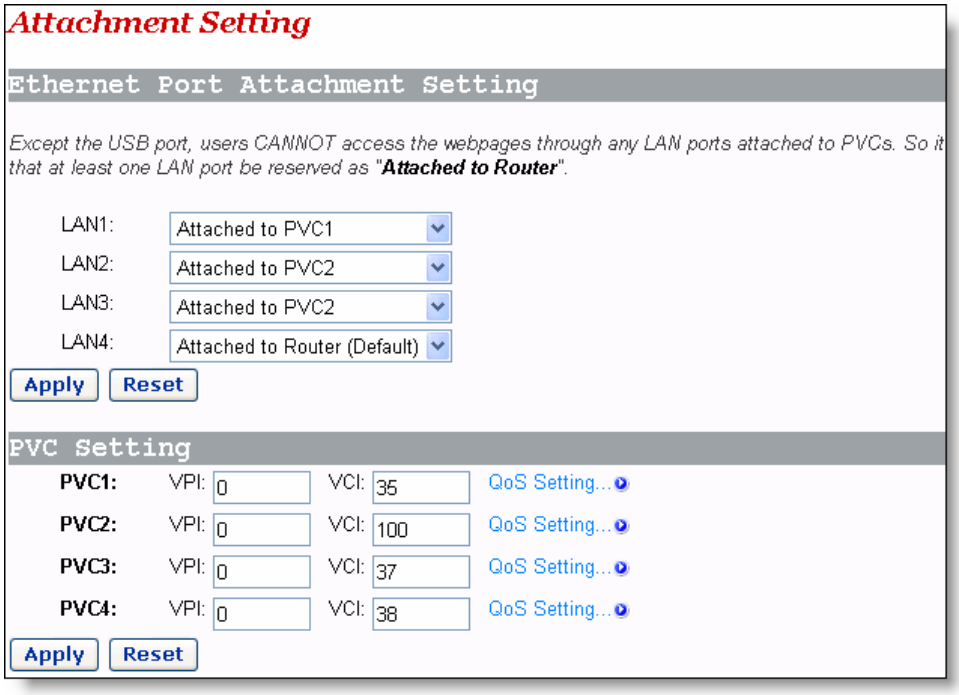


Figure 5-2 Actual configuration on the Attachment Setting page

3) Click <Quick Setup> in the navigation bar and select the PPPoE Login option on the [WAN Connections] page. Set the values of VPI and VCI to **8** and **35** respectively, type **userName**, **myPassword**, and **myPassword** in the PPPoE Username, PPPoE Password, and PPPoE Password (confirm) text boxes respectively and then click <Apply> to save your settings.

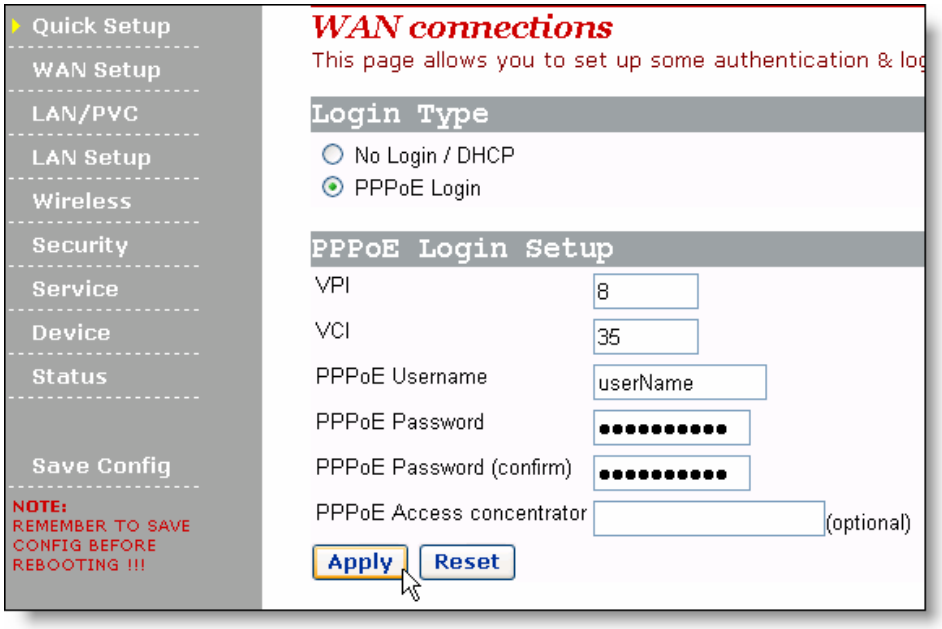


Figure 5-3 Set the PPPoE authentication information

4) It takes about two minutes for your settings to take effect. Figure 5-4 depicts these settings. Actual configuration on the WAN connections page Click <Status> in the navigation bar to bring up the [Status] page as shown in Figure 4-38. You can find that the WAN IP Address item is a public IP address instead of the original one 0.0.0.0. Then you can access the Internet through a PC connected to the LAN4 port.

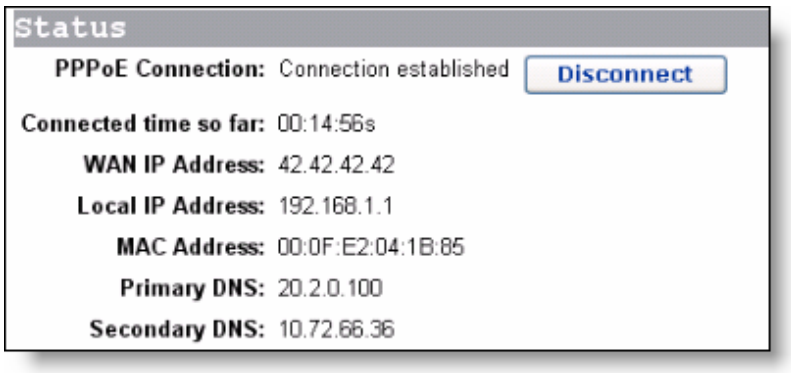


Figure 5-4 Actual settings on the Status page

5) Verify the binding of the LAN ports to the PVCs. Connect a PC which is configured to obtain an IP address automatically to the LAN1 port. You can then access the IPTV Website of your ISP. Similarly, connect PCs to the LAN2 and LAN3 ports and access the Internet by PPPoE connection. After you enter the user name and password, the PC can obtain an IP address quickly and set up a connection with the Website.

II. QoS configuration

For the upstream packets over an ADSL line, your DR814Q supports multiple asynchronous transfer mode (ATM) services, such as CBR, VBR-rt, VBR, UBR, and ABR. DR814Q provides different measures, caching space, scheduling priorities, and service shaping to allocate appropriate bandwidth to ATM services of different types. This ensures high-performance QoS.

Click <QoS Setting…> in the [PVC Setting] section as shown in Figure 5-1 to enter the [QoS Config] page of a corresponding PVC as below.

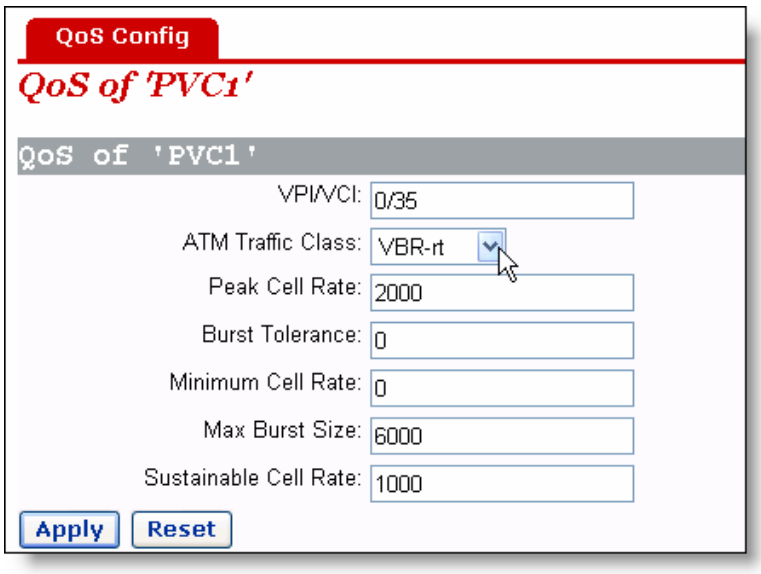


Figure 5-5 QoS Config page

You can set different ATM service types for specified PVCs from the ATM Traffic Class drop-down list and configure QoS parameters for the selected service type. For more information, refer to Table 5-1.

Table 5-1 Description of commonly used ATM service types

Service type	Description
UBR (unspecified bit rate)	Suitable for services that are not real-time-critical and with large burst traffic. UBR demands best-effect services on the network side. When applying for services, you are not required to set QoS parameters except for PCR, which limits the upper rate. The network side does not guarantee QoS for UBR services. UBR cells will be discarded first in a network congestion. Error correction is carried out by upper-layer protocols. Typical applications are FTP and E-mail.
CBR (constant bit rate)	Suitable for services that require static bandwidth and demand the highest priority. This type of service can provide stable traffic with the minimum burst. Only PCR parameter is needed for CBR service application. The source can transmit cells at a negotiated PCR or a rate lower than it. Typical applications are circuit and emulated voice.

Service type	Description
VBR-rt (real-time variable bit rate)	Sensitive to delay and jitter of data flow. Similar to CBR except that they are delay- and jitter-sensitive. VBR-rt services allow limited burst. The transmission rate on source side can be different at different time. The parameters required for VBR-rt service application include PCR, SCR, and MBS or BT. Typical VBR-rt applications are voice and interactive video services and IPTV.
VBR (non-real-time variable bit rate)	Suitable for bursting non-real-time services. Compared to VBR-rt, a distinct feature of VBR services is that demands of real-time are not so crucial, and the priority for service data processed on the network side is also lower than that of VBR-tithe parameters required by VBR services include PCR, SCR, and MBS (or BT), the same as that of VBR-rt.

Keep 0 unchanged for those options unrelated to the configuration. As shown in Figure 5-5, if **VBR-rt** is selected from the ATM Traffic Class drop-down list, you need to set values for Peak Cell Rate, Max Burst Size, and Sustainable Cell Rate and leave **0** in the Burst Tolerance and Minimum Cell Rate text boxes.

An example is taken to explain how to configure ATM QoS parameters. You must configure to meet the following requirements for the ATM QoS parameters of your DR814Q to take effect:

- The digital subscriber line access multiplexer (DSLAM) has a relax control or even no control over the LAN port and PVC upstream rates, entirely depending on the ADSL line. The actual upstream rate of ADSL can be 896 Kbps at most if DSLAM supports ADSL only.
- Multiple PVCs are configured on a single ADSL line.

Suppose that:

The downstream rate of each PVC is strictly specified by the central office (CO), whereas the upstream rates of the PVCs are all configured to 896 Kbps.PVC1 and PVC2 are configured on each ADSL line, among which you use PVC1 to access the Internet and PVC2 to provide video chatting service.

Analysis:

Although an upstream rate of 896 Kbps is configured to PVC1 and PVC2 respectively at the CO, audio and video services carried out over them may still be interfered. For example, an uploading service, which consumes a bandwidth lager than 500 Kbps, bursts on PVC1 when a video conference, which requires a minimum bandwidth of 384 Kbps for both upstream and downstream rates, is carried out over PVC2. This results in the available bandwidth for PVC2 less than 384 Kbps, thus causing the audio and video service interrupted.

To avoid this, configure the QoS parameters as follows:

1) Click <QoS Setting…> in the [PVC Setting] section as shown in Figure 5-1 to enter the [QoS Config] page of PVC2.

2) Select the **VBR-rt** option from the ATM Traffic Class drop-down list.
3) Set Peak Cell Rate to **2000** (approximately 800 Kbps), Max Burst Size to **6000**, and Sustainable Cell Rate to **1000** (approximately 400 Kbps).
4) Click <Apply> to save your settings.

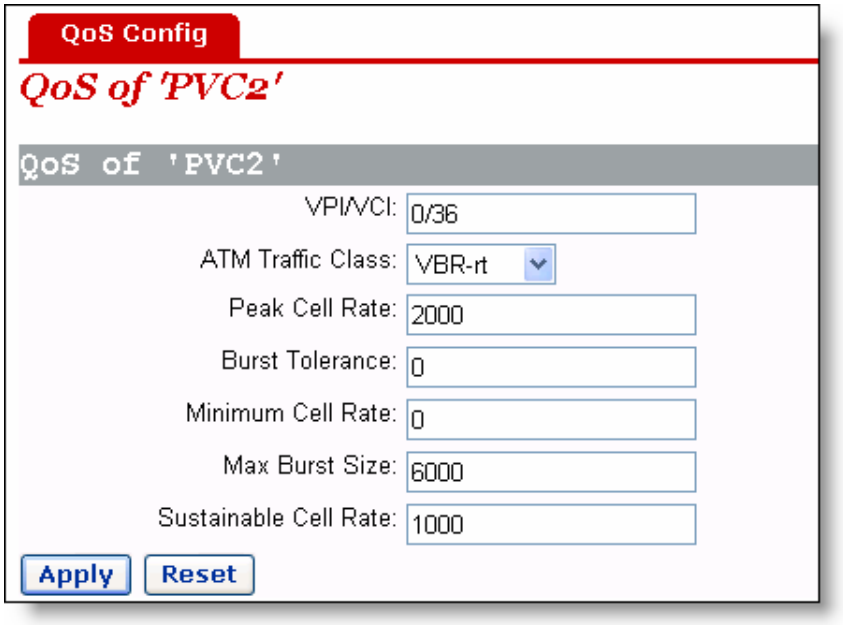


Figure 5-6 QoS configuration

For PVC1, keep the default UBR settings unchanged. Thus, PVC1 can occupy all the upstream bandwidth when there is no traffic on PVC2, and PVC2 can always be guaranteed with an average bandwidth of 400 Kbps for audio and video services over it. This ensures normal upload over PVC1 and non-interrupted real-time communication over PVC2.

5.2 Security

Click [Security] in the navigation bar to enter the corresponding page where four tabs are available: Interface, Policy, Trigger and IDS. Click any tab to enter your desired configuration page.

5.2.1 Interface

Every firewall policy is intended for access between security interfaces. This page allows you to enable the security function and configure security interfaces.

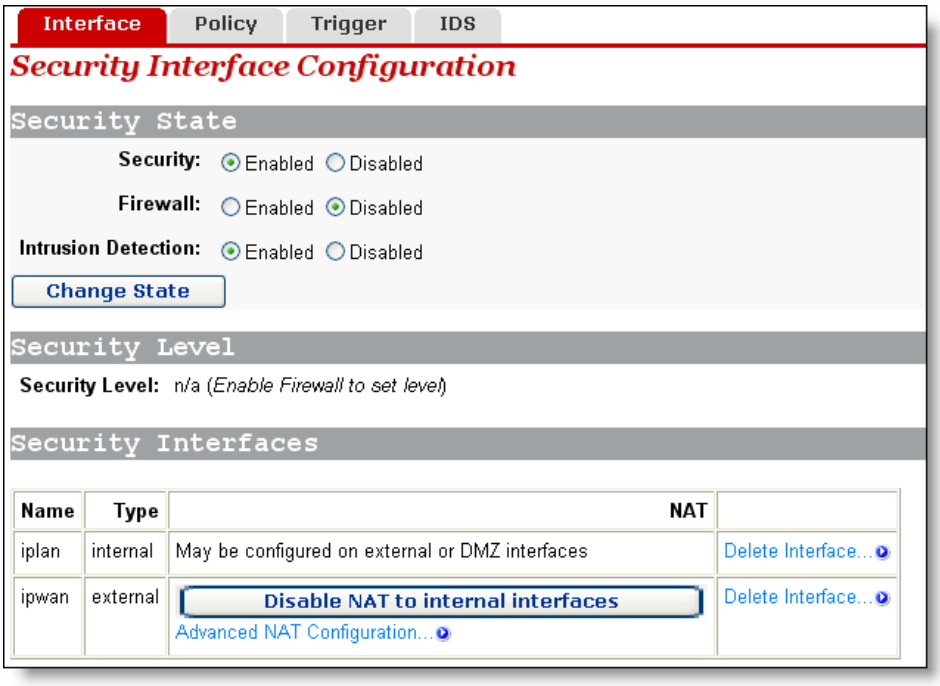


Figure 5-7 Add a security interface

I. Security state

To enable/disable the security function, select the corresponding **Enabled/Disabled** option, and then click <Change State>.

Likewise, such operation can also be used to enable/disable the firewall and intrusion detection.

⚠ **Caution:**

- You can enable the firewall, intrusion detection and NAT only when the security function is enabled.
- If the security function is disabled, the firewall, intrusion detection and NAT are also necessarily disabled.

II. Security level

After the firewall is enabled, the [Security Level] drop-down list appears in the [Security Level] section as below.

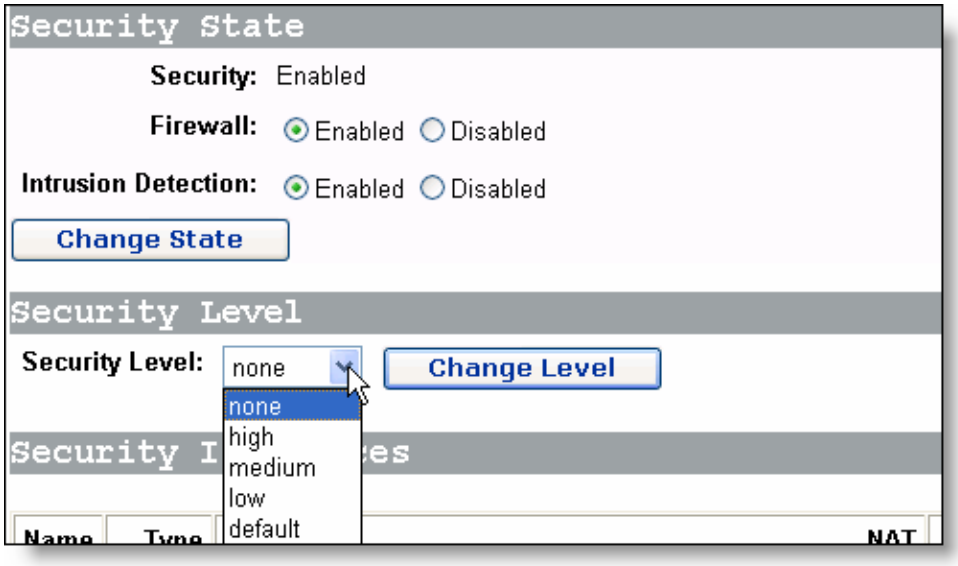


Figure 5-8 Security Level drop-down list

This drop-down list includes the following options:

- none: (default setting) Indicates that the external and internal users have no access right.
- high: Indicates that the internal users have some access rights and the external users have no access right.
- medium: Indicates that the external and internal users have more access rights.
- low: Indicates that the external and internal users have the maximum access rights.
- default: Indicates that the internal users can access all the Internet services, the external users are prevented to access the internal network

To set the corresponding security level, select an option from the drop-down list, and then click <Change Level>.

Caution:

- By default, the **none** security level is not configured with port filtering policies. In this case, internal users cannot access all the Internet services, and the internal network cannot be accessed from the outside, either. To enable the access right to a service, you need to configure the corresponding port policy.For details, refer to section 5.2.2 “Policy”.
- The default port filtering policies are configured to the security levels except **none**. After a security level is set, the corresponding policy appears on the port filtering page.You can also configure a policy manually as needed.For details, refer to section 5.2.2 “Policy”.

III. Security interface

You can establish the corresponding firewall policy between a group of security interfaces. The security interface table lists the information about existing security interfaces. By default, the DR814Q defines all interfaces as security ones and you cannot create a new security interface any more. If you have created a virtual interface (refer to section 4.3.1 “LAN”), <Add Interface…> appear on the page as below.

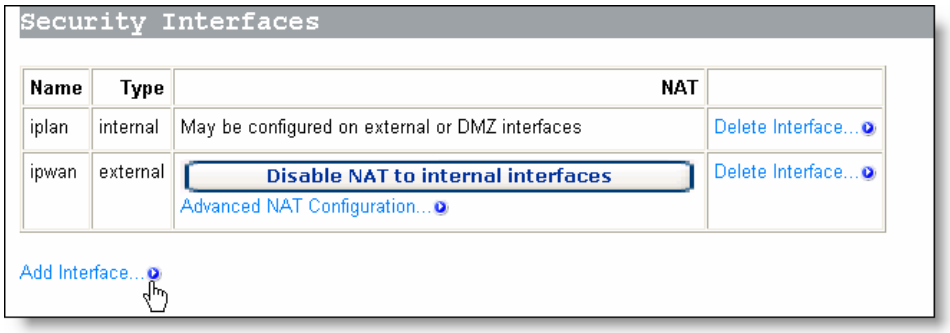


Figure 5-9 Security interface

In this case, you can add a security interface by clicking <Add Interface…> to enter the page as below.

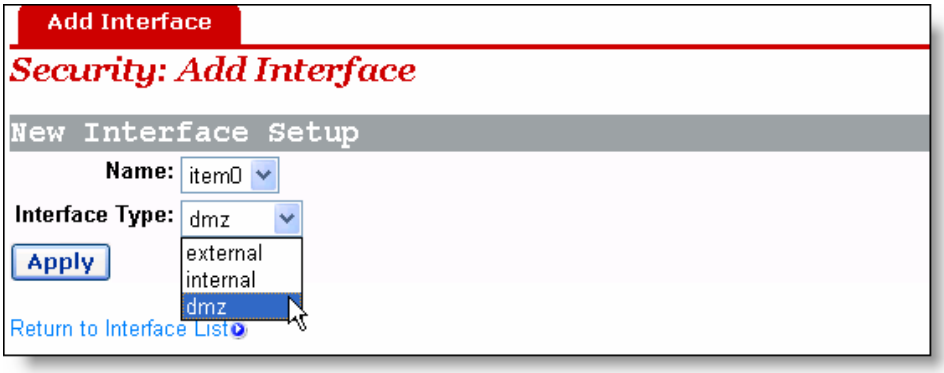


Figure 5-10 Security – add an interface

Select an interface type, **external**, **internal** or **DMZ** from the [Interface Type] drop-down list, and then click <Apply>.The configured interface has been added to the security interface table on the [Security Interfaces] section as below.

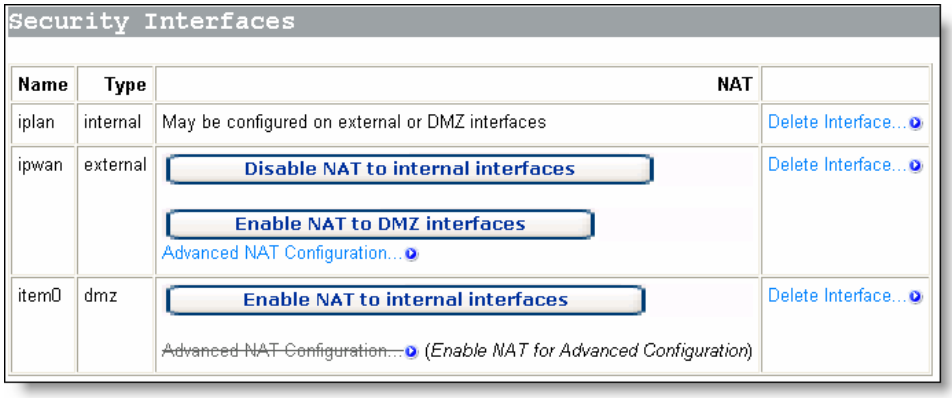


Figure 5-11 Security interface table

To delete a security interface, click the corresponding <Delete Interface…> button, and then click <Delete> on the [Delete Interface] page.

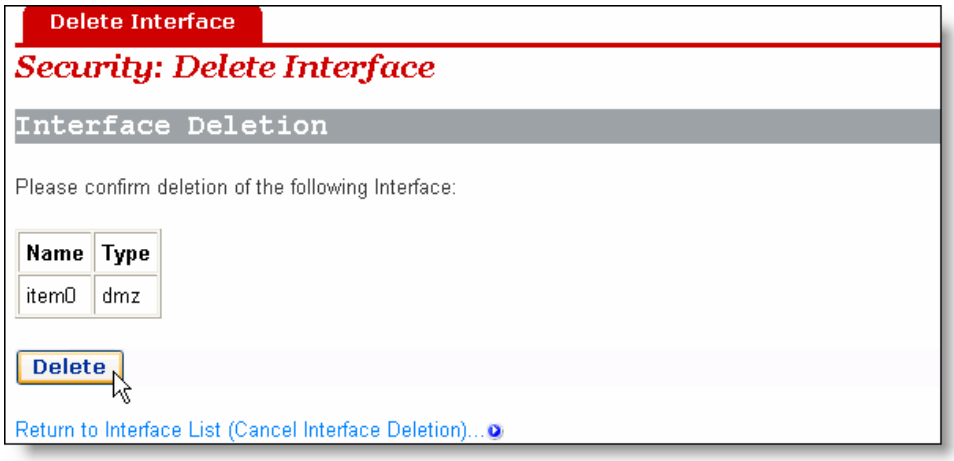


Figure 5-12 Delete a security interface

IV. NAT configuration

The NAT technology can translate an internal private address into a valid public IP address, and thus PCs in the LAN can share a public IP address for network access.

You can click the three buttons on the page as shown in Figure 5-11 to enable/disable NAT between the three types of interfaces. After the NAT is enabled, you can perform advanced NAT configuration. Click <Advanced NAT Configuration…> to enter the configuration page as below.

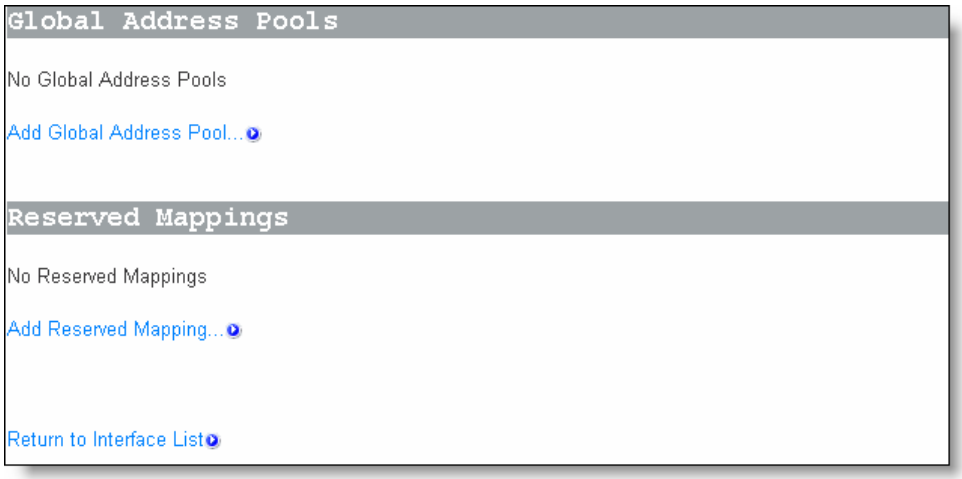


Figure 5-13 Advanced NAT configuration

1) Global address pool

This page allows you to add a public IP address obtained from your ISP to the global address pool. After NAT is enabled, internal addresses are randomly translated to an unused address in this pool.

To add a public IP address or an address pool, click <Add Global Address Pool…> to enter the configuration page as below.

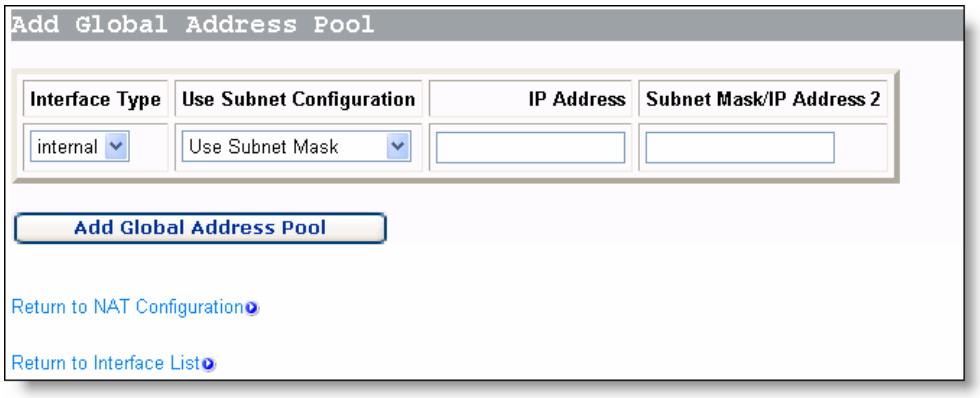


Figure 5-14 Add a global IP address pool

Table 5-2 Description on the items of the global IP address pool

Item	Description
Interface Type	Select the interface type corresponding to a public IP address from the drop-down list.
Use Subnet Configuration	Select the method to specify the address from the drop-down list. The **Use Subnet Mask** option indicates to specify a network segment. The **Use IP Address Range** option indicates to specify a range of the IP address.
IP Address	Type in the IP address of a segment if the **Use Subnet Mask** option is selected. Type in the start IP address if the **Use IP Address Range** option is selected.
Subnet Mask/IP Address2	Type in the subnet mask of the segment if the **Use Subnet Mask** option is selected. Type in the end IP address if the **Use IP Address Range** option is selected.

Click <Add Global Address Pool> after the configuration is complete. This IP address will be added to the address pool.

2) Virtual server

After NAT is enabled, the internal network devices cannot be accessed from the Internet. To provide public services such as Web server, Email and FTP for the outside, a virtual server needs to be configured to make the network computer with private static IP address provide these services. Although the internal service address cannot be accessed by external users directly, the DR814Q can identify service requests through port number and forward them to the virtual server.

To configure a virtual server, click <Add Reserved Mapping…> in the [Reserved Mappings] section (see Figure 5-13) to enter the page as below.

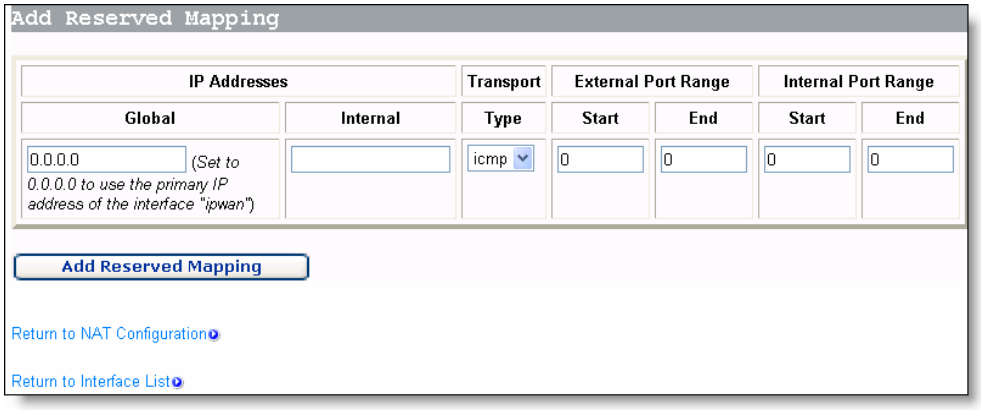


Figure 5-15 Virtual server configuration page

Table 5-3 Description on the items of the virtual server

Item		Description
IP Address	Global	The default address, 0.0.0.0, can be reserved which means that the address obtained from the WAN port is used. Or you can type in the address from the global address pool.
	Internal	Type in the IP address of internal PC providing application services.
Transport	Type	Select the protocol type for the application service from the drop-down list.
External Port Range		Most application services forward inbound and outbound packets through the same port. In this case, you can just configure **Start** and **End** as this port number. But some application services forward inbound and outbound packets respectively through different ports. In this case, you need to type in the port range used by the inbound packets.
Internal Port Range		Most application services forward inbound and outbound packets through the same port. In this case, you can just configure **Start** and **End** as this port number. But some application services forward inbound and outbound packets respectively through different ports. In this case, you need to type in the port range used by the outbound packets.

Click <Add Reserved Mapping> after the configuration is complete.

Example: To configure the PC with the address 192.168.1.100 as a virtual server to provide an FTP service for the outside (with the port number 21), refer to the configuration in Figure 5-16. Thus, all FTP requests from the Internet users will be forwarded to the PC (server) with the fixed IP address 192.168.1.100.

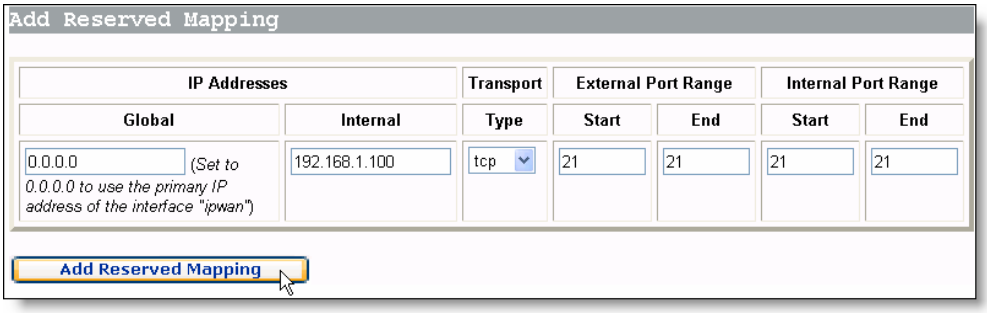


Figure 5-16 Example of the virtual server configuration

Note:

NAT can work between:

- External interface and internal interface
- External interface and DMZ
- DMZ and internal interface.

5.2.2 Policy

Security policy is a rule set to limit inbound and outbound data between different types of interfaces. The DR814Q provides a powerful security module to support the firewall policies configured between external and internal interfaces, between external interface and DMZ, and between DMZ and internal interface respectively, thereby satisfying various demands on network security. The firewall must be enabled before the creation of a policy.

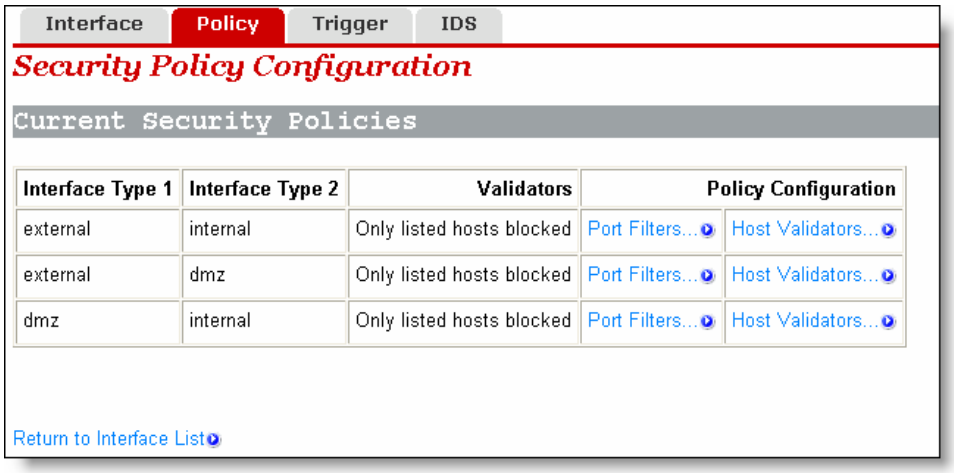


Figure 5-17 Security policy configuration

I. Port filter

You can configure the port filtering policy to limit the data transmission of a protocol type.

To configure a group of interfaces (suppose external interface and internal interface) with the port filtering policy, click the corresponding <Port Filters…> button to enter the page as below.

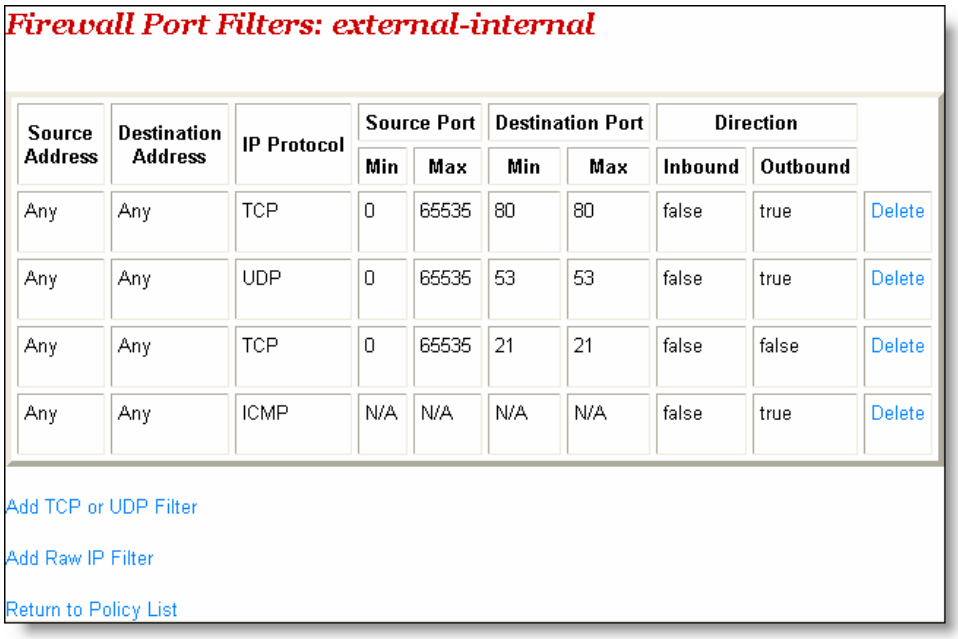


Figure 5-18 Firewall port filter

This page lists the currently configured policies. Select different firewall security level to display the corresponding port filtering policies. Other types of packet requests not configured with the policies will be blocked by the firewall.

To delete a policy, click the corresponding <Delete> button, and then click <Delete> to confirm on the popup page.

To add a policy for the port number of the protocol, click <Add TCP or UDP Filter> to enter the page as below.

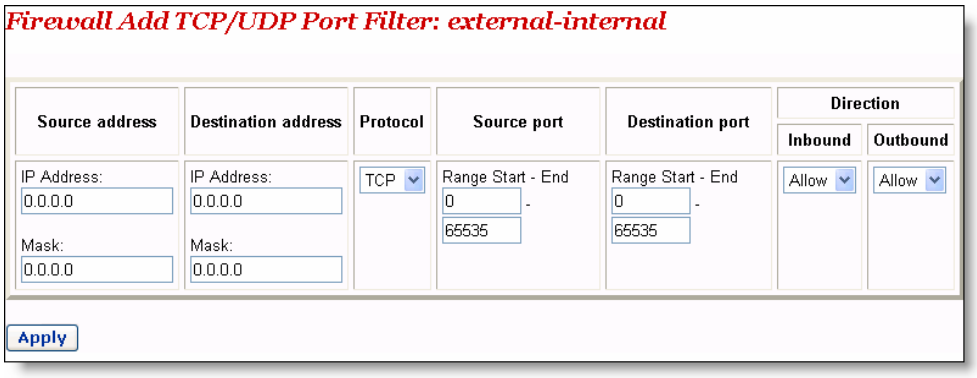


Figure 5-19 TCP/UDP port filtering policy

Table 5-4 Description on the items of TCP/UDP port filter

Item		Description
Source address	IP Address	Type in the source IP address. The default address 0.0.0.0 indicates any node on the network.
	Mask	Type in the subnet mask of the source. The default mask 0.0.0.0 indicates any node on the network.
Destination address	IP Address	Type in the destination IP address. The default address 0.0.0.0 indicates any node on the network and is usually reserved.
	Mask	Type in the subnet mask of the destination. The default mask 0.0.0.0 indicates any node on the network and is usually reserved.
Protocol		Select a protocol type (TCP or UDP) from the drop-down list and apply the filtering policy to the packets of this type.
Source port	Range Start-End	Type in the port range of the source. The default range from 0 to 65535 indicates any node and is usually reserved.
Destination port	Range Start-End	Type in the port range of the destination. Generally, this parameter needs to be set. For example, to control Web services, type in the corresponding port number **80**. To control FTP services, type in the port number **21**.
Direction	Inbound	The direction of inbound data. Select **Allow** to permit external hosts to access internal hosts. Select **Block** to forbid external hosts to access internal hosts.
	Outbound	The direction of outbound data. Select **Allow** to permit internal hosts to access external hosts. Select **Block** to forbid internal hosts to access external hosts.

Click <Apply> after the configuration is complete. This policy will be added to the list of port filtering policies.

Example: If you want the internal users to access the external HTTP server (with the port number 80), but do not want the external users to access the internal HTTP server, you can perform the configuration as below.

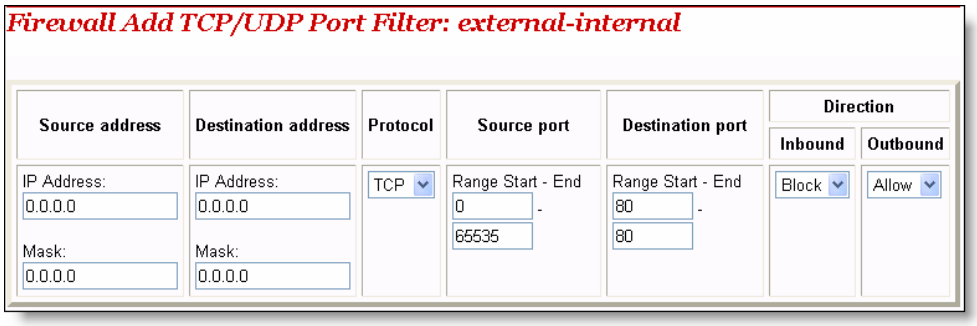


Figure 5-20 Example of the port filtering configuration

To add a policy for a protocol, click <Add Raw IP Filter> in Figure 5-18 to enter the page as below.

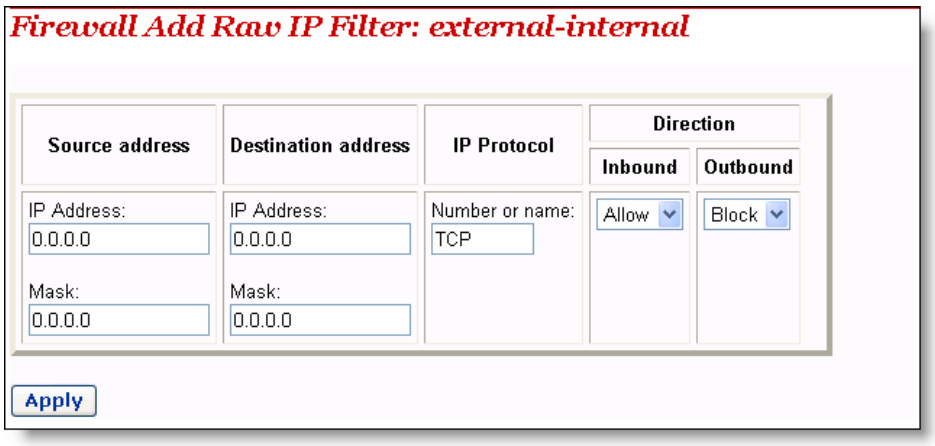


Figure 5-21 Filtering policy based on the protocol type

Table 5-5 Description on the items of the filtering policy

Item		Description
Source address	IP Address	Type in the source IP address. The default address 0.0.0.0 indicates any node on the network.
	Mask	Type in the subnet mask of the source. The default mask 0.0.0.0 indicates any node on the network.
Destination address	IP Address	Type in the destination IP address. The default address 0.0.0.0 indicates any node on the network and is usually reserved.
	Mask	Type in the subnet mask of the destination. The default mask 0.0.0.0 indicates any node on the network and is usually reserved.

Item		Description
IP Protocol	Number or name	Type in a protocol name or number and apply this filtering policy to the packets of this type. The protocol name can be TCP, UDP or ICMP. For other protocols, you need to type in their protocol numbers. For example, type in 2 for IGMP, and 46 for RSVP.
Direction	Inbound	The direction of inbound data. Select **Allow** to permit external hosts to access internal hosts. Select **Block** to forbid external hosts to access internal hosts.
	Outbound	The direction of outbound data. Select **Allow** to permit internal hosts to access external hosts. Select **Block** to forbid internal hosts to access external hosts.

Click <Apply> after the configuration is complete. This policy will be added to the list of port filtering policies.

Example: By default, the external hosts are not allowed to ping the WAN port even if the security level is set to **low**. To allow the internal hosts and external hosts to ping each other, you can perform the configuration as below.

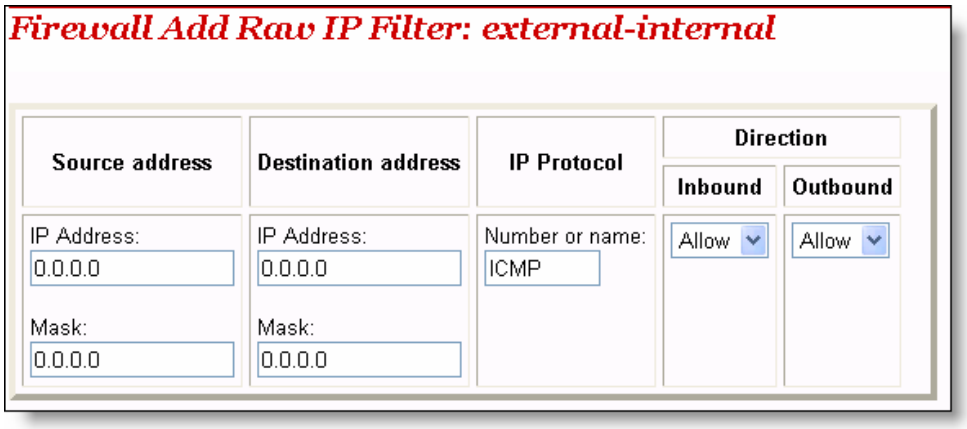


Figure 5-22 Example of the filtering policy for a protocol (2)

II. Host validators

By specifying the IP address and configuring the corresponding policy, you can restrict the access right of a host or hosts on a network segment.

To configure host validators to a group of interfaces, click the corresponding <Host Validators…> button in the [Current Security Policies] section (see Figure 5-17) to enter the page as below.

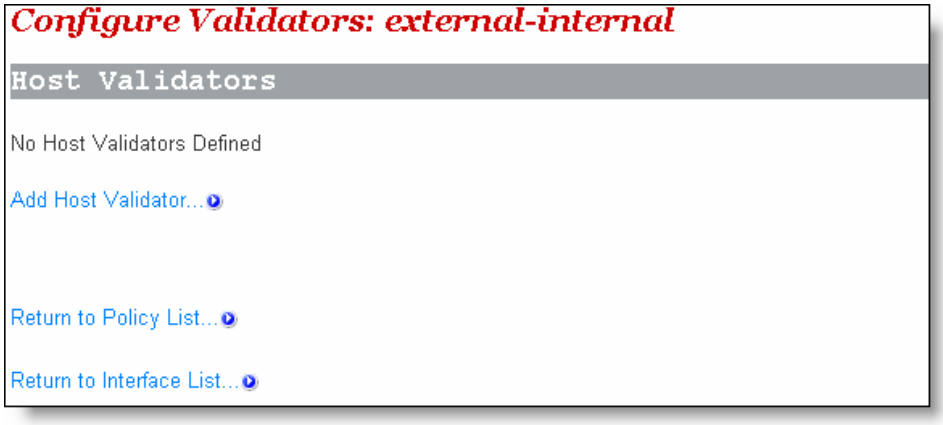


Figure 5-23 Host validators page

To add a host validator policy, click <Add Host Validator…> to enter the page as below.

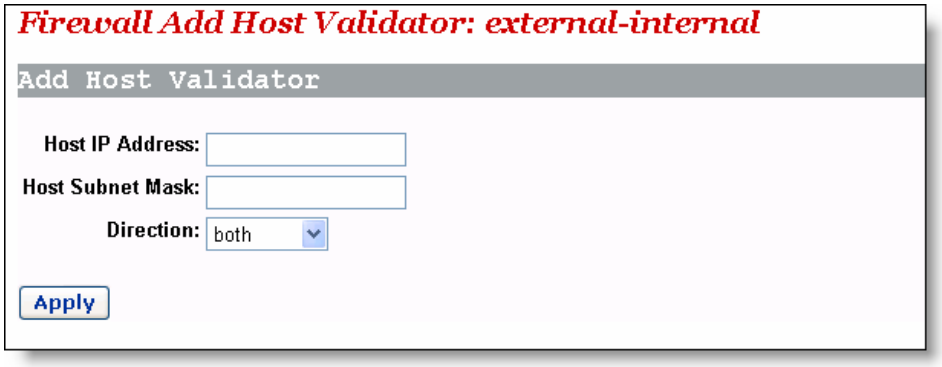


Figure 5-24 Configure a host validator

Table 5-6 Description on the items of the host validator

Item	Description
Host IP Address	Type in the IP address of the host or network segment to be restricted.
Host Subnet Mask	Type in the subnet mask of the host or network segment to be restricted.
Direction	Select the direction of data transmission. Select **inbound** to block the inbound data only. Select **outbound** to block the outbound data only. Select **both** to block both inbound data and outbound data.

Example: To block a host with the IP address 192.168.1.10 in the LAN to access an external network, and permit the external users to access this host, you can perform the configuration as below, and then click <Apply>.

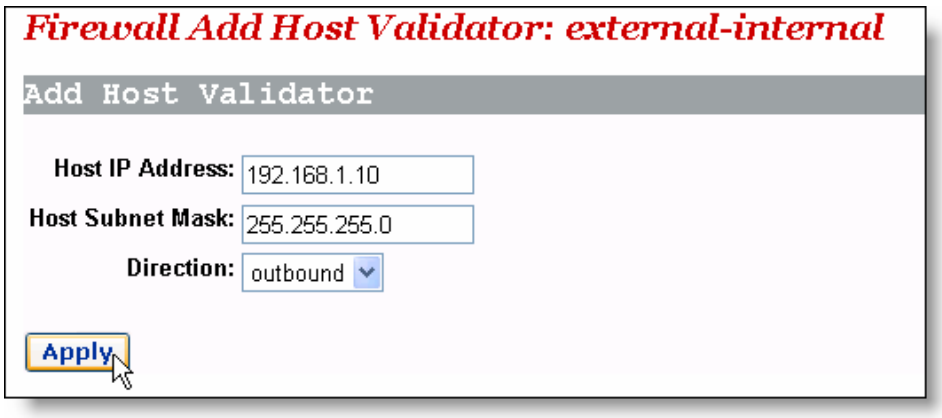


Figure 5-25 Example of the host validator configuration (1)

Example: If you find a suspicious host (with the IP address 10.1.1.2) in an external network, you can set the host validator policy as below to block its attack on the internal host.

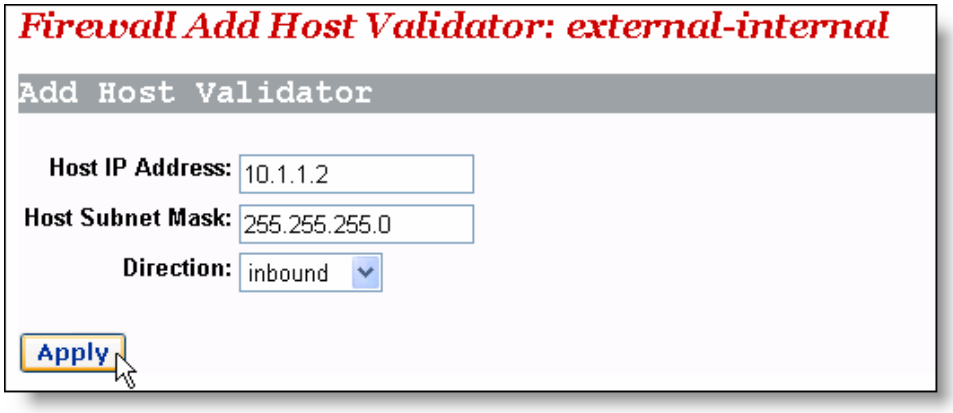


Figure 5-26 Example of the host validator configuration (2)

As shown in Figure 5-26, **inbound** is selected from the [Direction] drop-down list, and thus the device only block the data from the address 10.1.1.2 to the internal host while the internal host can still send data to the address 10.1.1.2.

⚠ **Caution:**

- The host validator can be used to limit the data stream between the WAN and LAN ports.
- The security policy takes effect only when the firewall is enabled.

5.2.3 Trigger

A security trigger is used to deal with application protocols that set up separate sessions. Some application protocols, such as NetMeeting, open the primary sessions and secondary connections at the same time during the normal operations. The trigger tells the security mechanism to handle these secondary sessions and instruct it how to handle them. The trigger handles the situation dynamically, allowing the secondary sessions only when appropriate. These newly triggered sessions are not restricted by the firewall.

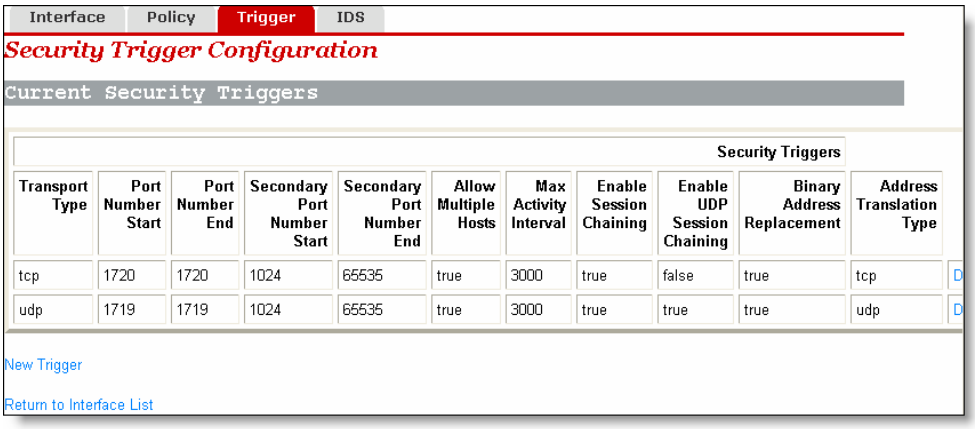


Figure 5-27 Security trigger

This page allows you to:

- View the information in the current security trigger list.
- Create a new security trigger and add it to the current security trigger list.
- Delete an existing security trigger.

To create a new security trigger, click <New Trigger> to enter the page as below.

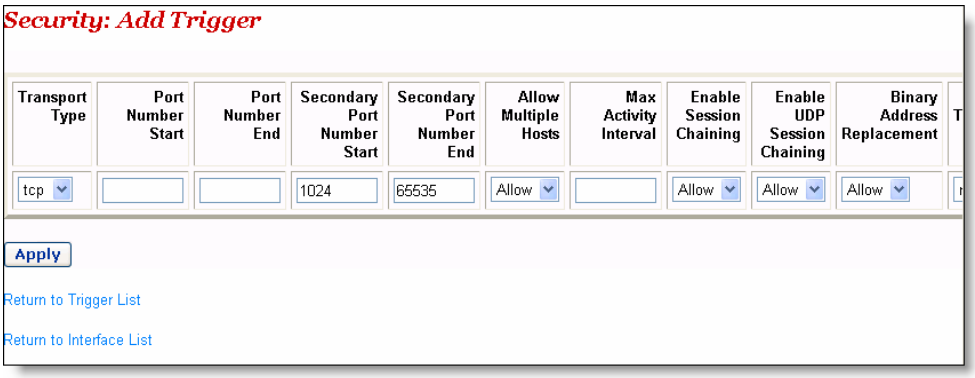


Figure 5-28 Add a security trigger

Table 5-7 Description on the items of the security trigger

Item	Description
Transport Type	From the drop-down list, select a transport type (TCP or UDP) to which the newly added trigger is specified.
Port Number Start	Type in the start of the trigger port range that the primary session uses.
Port Number End	Type in the end of the trigger port range that the primary session uses.
Secondary Port Number Start	Type in the start of the trigger port range that the secondary session uses.
Secondary Port Number End	Type in the end of the trigger port range that the secondary session uses.
Allow Multiple Hosts	Select **Allow** if you want a secondary session to be initiated by different remote hosts. Select **Block** if you want a secondary session to be initiated only by one remote host.
Max Activity Interval	Type in the maximum activity interval (in milliseconds) for secondary port sessions after the primary session starts.
Enable Session Chaining	Select **Allow** or **Block** to determine whether the multi-level TCP session chaining is accepted or not.
Enable UDP Session Chaining	Select **Allow** or **Block** to determine whether the multi-level UDP session chaining is accepted or not. Before this, you must enable the session chaining.
Binary Address Replacement	Select **Allow** or **Block** to determine whether to use the binary address replacement on the current trigger or not.
Address Translation Type	Specify the address replacement type on a trigger. Before this, you must set the binary address replacement to **Allow**.

Click <Apply> after the configuration is complete. The [Security Trigger Configuration] page is displayed, containing details of the trigger that you have just configured.

To delete an existing security trigger, click the corresponding <Delete> button in Figure 5-27 and then click <Delete>.

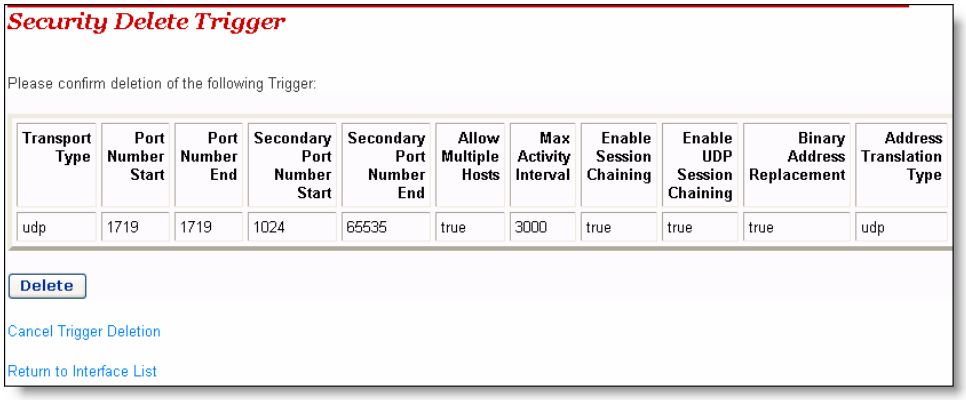


Figure 5-29 Delete a security trigger

In fact, the DR814Q has provided an Application Level Gateway (ALG) for NetMeeting. NetMeeting applications can be also normal even if the port trigger is not configured. The following example is taken to show how to configure a port trigger if the DR814Q does not provide the ALG for NetMeeting.

Suppose your PC is connected to the LAN interface of the DR814Q, and you want to use NetMeeting to have an audio/video chat with Internet users, and to apply whiteboard and program sharing.

Analysis:

A NetMeeting call is established on the TCP 1720 port. After the connection is established, NetMeeting needs to re-enable the TCP 1503 port to use whiteboard and program sharing. NetMeeting also needs to enable any port of TCP and UDP protocols within the range of 1024 to 65535 to transmit audio and video signals. After the firewall is enabled, you can configure the port filtering policies and virtual servers of TCP and UDP protocols to all ports within the range. In this way, Internet users can actively call a LAN user during the use of NetMeeting. However, possible omission in configuring the filtering policy and virtual server may cause the failure of the audio/video chat establishment. Moreover, the virtual server configuration exposes almost all the LAN host ports to the Internet, resulting in the insecurity of the host.

To solve these problems, you can perform the configuration as below to make the TCP 1720 port trigger TCP/UDP port within the range of 1024 to 65535.

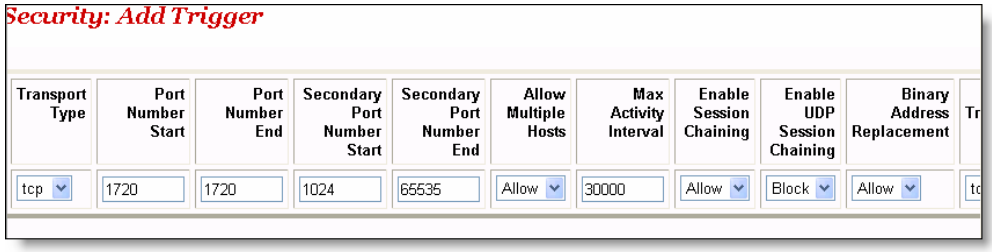


Figure 5-30 Example of the trigger configuration

In this way, all applications provided by NetMeeting can be used normally after a LAN user calls the Internet user and you can just add the access policy suitable for packets on the TCP 1720 port on the corresponding page (see Figure 5-19).To make the Internet users call LAN users and use NetMeeting normally, you can just configure the virtual server on the TCP 1720 port on the corresponding page (see Figure 5-15) and combine it with the port trigger mentioned previously.

5.2.4 IDS

IDS protects the current network from the following attacks:

- Denial of Service (DoS).
- Port scanning.
- Web spoofing.

IDS also implements the blacklist function. It stops external hosts that try to invade the network from accessing the DR814Q within a specific time limit.

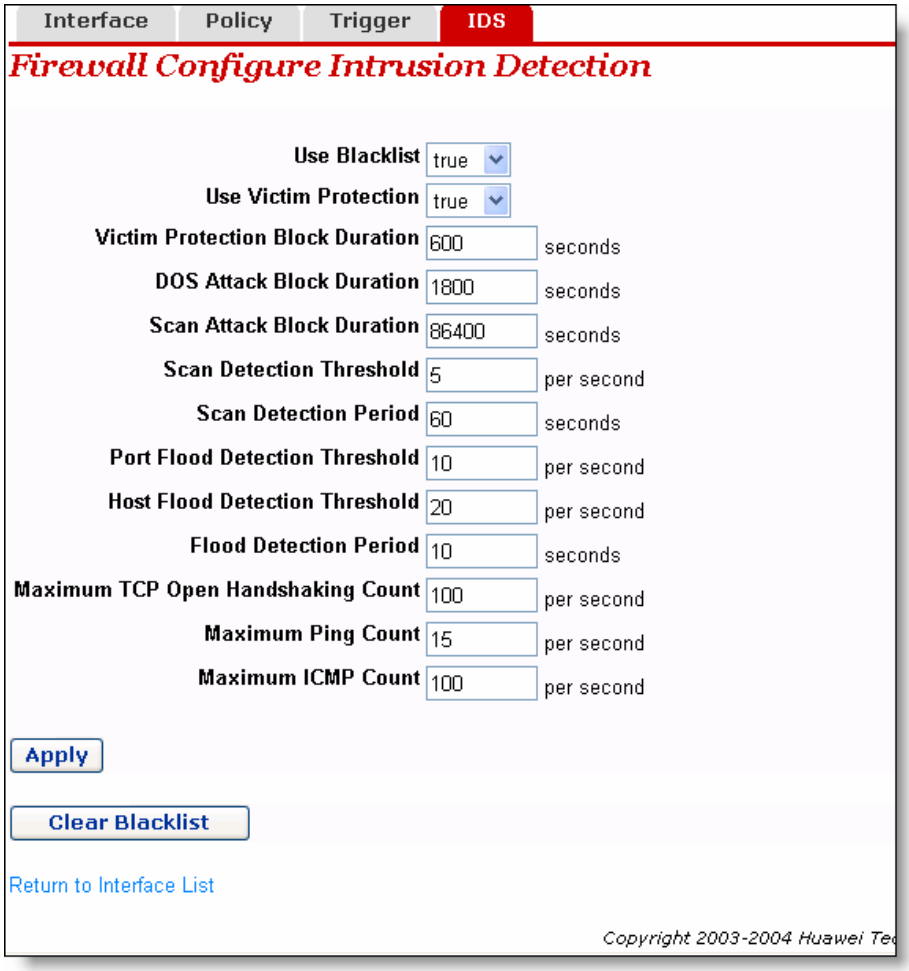


Figure 5-31 IDS configuration

Table 5-8 Description of the IDS configuration items

Item	Description
Use Blacklist	Select true or false to enable or disable the blacklist function. When the external host attacks (Ascend Kill, Echo Scan, WinNuke, Xmas Tree Scan, IMAP SYN/FIN Scan, SMURF, TCP SYN Flood, Net Bus Scan and Back Orifice Scan) are found, these hosts are put into the blacklist and their packets are filtered out within the set time limit.
Use Victim Protection	Select **true** or **false** to enable or disable the Smurf protection which protects the DR814Q against attacks caused by pings with a broadcast address. The attacker may broadcast pings with the victim's MAC address as the source MAC address. Without this protection, hosts in LAN will send response packets to the victim when receiving these packets, and even cause the collapse of the victim. With this protection, the DR814Q will detect and drop ICMP packets sent by the attacker and continue to do so within a specific time limit.
Victim Protection Block Duration	Block duration of Web Spoofing (Smurf) attacks on the host. If the device detects these attacks, it will filter all the ICMP packets that attack the host and continue to do so within a specific time limit. The default value is 10 minutes.
DOS Attack Block Duration	Block duration of DoS attacks on the host. If the DR814Q detects these attacks, it will filter all the packets that attack the host and continue to do so within a specific time limit. The default value is 30 minutes. DoS attacks will prevent legitimate users from accessing normal Internet services. The DoS attacks that the device can detect include Smurf Attack, SYN/FIN/RST Flood, ICMP Flood, Ping Flood, Ascend Kill, WinNuke Attack and Echo Chargen.
Scan Attack Block Duration	Block duration of port scanning attacks on the host. If the DR814Q detects these attacks, it will filter all the packets that attack the host and continue to do so within a specific time limit. The default value is 24 hours.
Scan Detection Threshold	Threshold of port scanning packets. When the DR814Q detects port scanning packets (such as SYN/ACK, FIN or RST) sent by a host per second and the number of packets reaches the threshold, the device regards them as port scanning attacks. The port scanning attacks that the device can detect include Echo scan, Xmas Tree scan, IMAP scan, TCP SYN ACK scan, TCP FIN RST scan, NetBus scan, Back Orifice scan and SubSeven.Most of port scanning attacks are the Trojan Horse attack.
Scan Detection Period	Statistics duration of port scanning. When the device detects that port scanning continues to reach the set time, the device will block all the packets that attack the host and continue to do so within the time limit set in the [Scan Attack Block Duration] text box. The default value is 60 seconds.

Item	Description
Port Flood Detection Threshold	When the device detects that TCP SYNC packets sent by a host per second to a fixed port exceed this threshold, the device will time the Flood attack. If the timing reaches the limit set in the [Flood Detection Period] text box, the DR814Q concludes that the host is making a port flood attack, and starts blocking the packets sent by the host. The default value is 10.
Host Flood Detection Threshold	When the device detects that TCP SYNC packets sent by a host per second exceed this threshold, the device will time the Flood attack. If the timing reaches the limit set in the [Flood Detection Period] text box, the DR814Q concludes that the host is making a port flood attack, and starts blocking the packets sent by the host. The default value is 20.
Flood Detection Period	When the DR814Q detects that the duration of Flood attack by a host reaches the set detection period, the device starts blocking the packets sent by the host. The default value is 10 seconds.
Maximum TCP Open Handshaking Count	When the open handshaking count that the DR814Q receives per second from a host exceeds the set value, the device concludes that the SYN/ACK attack is detected. The default value is 100.
Maximum Ping Count	The attacker may send a number of ping packets to a network. These packets consume too much bandwidth and make normal network services unavailable. When the device detects that the count of ping packets sent by a host per second exceeds the set value, the device concludes that the ping flood attack is detected. The default value is 15.
Maximum ICMP Count	The attacker may send a number of ICMP (non-Echo Request) packets to a network. These packets consume too much bandwidth and make normal network services unavailable. When the device detects that the count of ICMP packets sent by a host per second exceeds the set value, the device concludes that the ICMP Flood attack is detected. The default value is 100.

To modify the current IDS configuration, type in the relevant values of IDS options, and then click <Apply>.

To clear the blacklist, click <Clear Blacklist>.

Caution:

By default, the security mode is enabled.

5.3 DMZ Configuration

The Demilitarized Zones (DMZ) feature of DR814Q allows you to configure a DMZ in a LAN. The hosts that are configured on the same segment with this DMZ can perform bi-directional communication with other Internet users or servers. At the same time, you can enable NAT and configure a firewall policy between DMZ interface and internal interface, and between DMZ interface and external interface. This not only provides a security shelter for the hosts in the DMZ, but also satisfies the needs of server installation in LANs by small and medium-sized enterprises to provide services such as FTP and Web for bi-directional communication with users.

The following figure depicts the steps to configure DMZ:

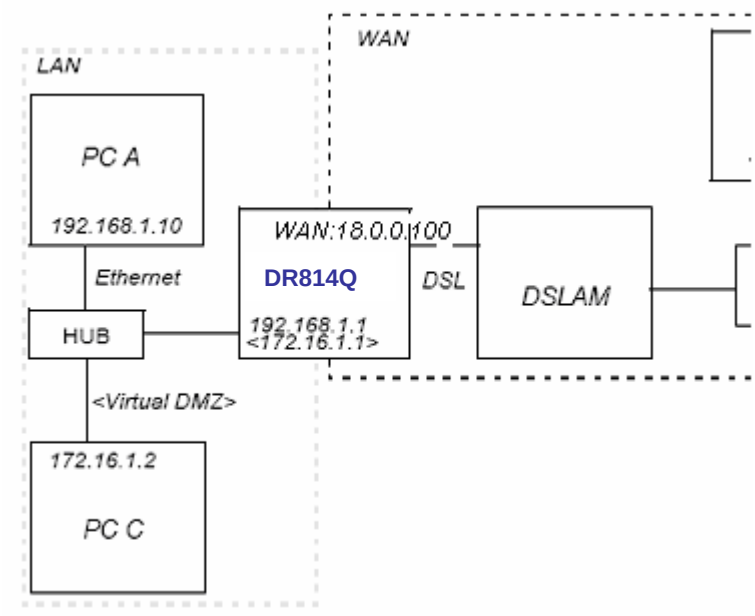


Figure 5-32 DMZ configuration

I. Create a virtual interface

To create a virtual interface, refer to section 4.3.1 “LAN”.

Type in the following parameters on the [Create virtual interface] page as below, and then click <Apply>.

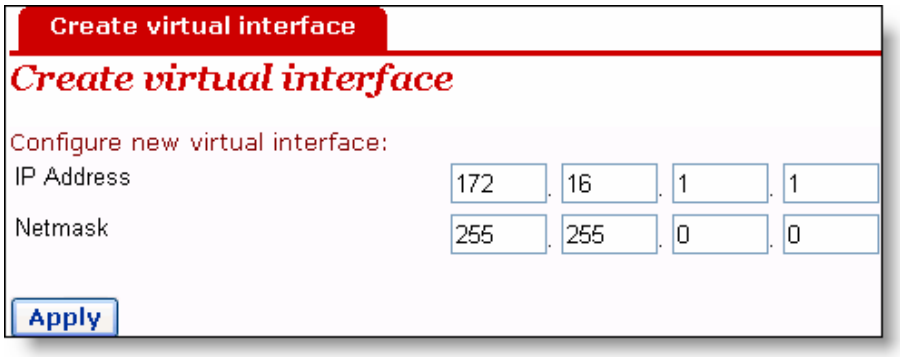


Figure 5-33 Create a virtual interface

The result appears on the [LAN connections] page (see Figure 4-16), showing that a virtual interface named item0 has been added into the list.

II. Add an security interface

Refer to section 5.2.1 III. “Security interface” to add a security interface.

Perform the configuration on the [Add Interface] page as below, and then click <Apply>.

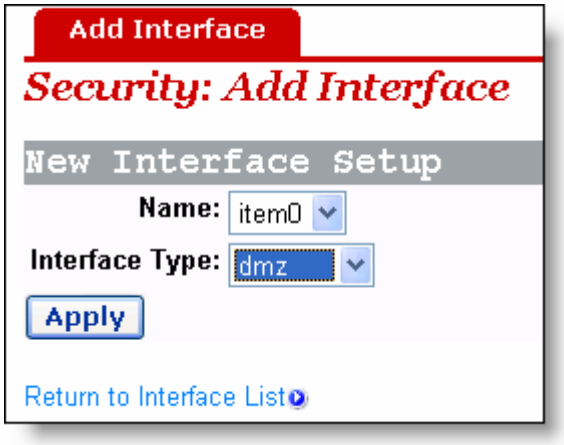


Figure 5-34 Add a security interface

Here, item0 is the virtual interface added previously.

III. Configure the port filtering policy for external-dmz and external-internal interfaces respectively

To configure port filtering policy for external-dmz and external-internal interfaces respectively, refer to section I. “Port filter".

Enter the [Firewall Port Filters: external-dmz] page to configure a policy, ensuring that users can access the Internet services (such as HTTP, FTP, and Telnet) specified by the DMZ zone through the external interface. Meanwhile, enter the [Firewall Port Filters: external-internal] page to configure the port filtering policy, ensuring to disable users under the external interface to access the host services under the internal interface.

IV. Configure a DMZ host in the same segment with a DMZ zone

Make sure that the IP address of the DMZ host is in the same segment as that of the above configured virtual interface. For example, configure the IP address to 172.16.1.100, the mask to 255.255.0.0, and enable the corresponding Internet service, and then connect this DMZ host to the LAN port of the DR814Q.

V. Configure the corresponding virtual server

To configure the corresponding virtual server, refer to section 5.2.1 IV. 2) "Virtual server".

Configure the DMZ host as a virtual server to provide the Internet services, such as http, ftp and telnet.

Thus, the entire DMZ is configured completely and securely.

5.4 Route Configuration

The static route configuration makes the DR814Q to communicate with PCs on different network segments. This option allows you to create static IP routes to destination addresses by an IP interface name or a gateway address.

To access the DR814Q configuration page, follow either of these steps:

- Click [WAN Setup] in the navigation bar to enter the [WAN Connections] page, and then click <Route setup…>.
- Click [LAN Setup] in the navigation bar to enter the [LAN Connections] page, and then click <Route setup…>.
- Click [Status] in the navigation bar to enter the [Status] page, and then click <Route setup…>.

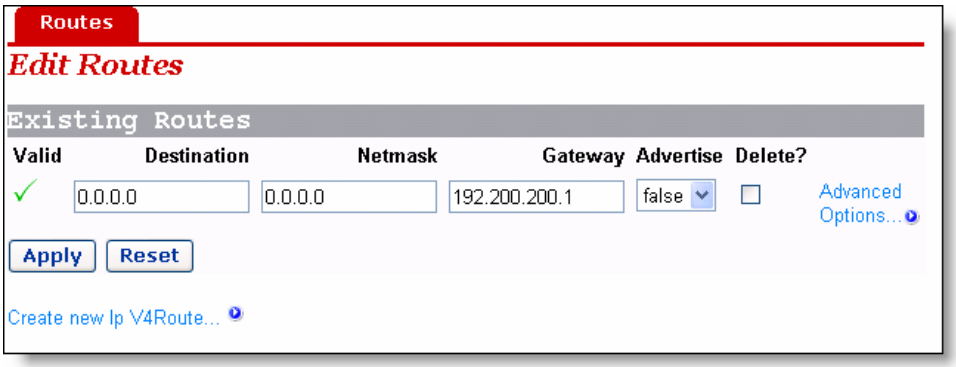


Figure 5-35 Route configuration

This page allows you to:

- View the information about existing routes
- Modify the route information in the route list
- Add a new route

- Delete an existing route

This page also allows you to view the following information about existing routes:

- Whether the route is valid ✓ or invalid ✗
- Destination IP address (Destination)
- Gateway address (Gateway)
- Network mask (Netmask)
- Whether the route is advertised via RIP (true or false)

To change the destination address, gateway address, netmask and advertise status of a route, change the settings in the relevant text boxes, and then click <Apply>.

To modify the cost or interface settings for the route, click <Advanced Options…> to enter the [Advanced Settings] page. Change the related value, and then click <OK>.

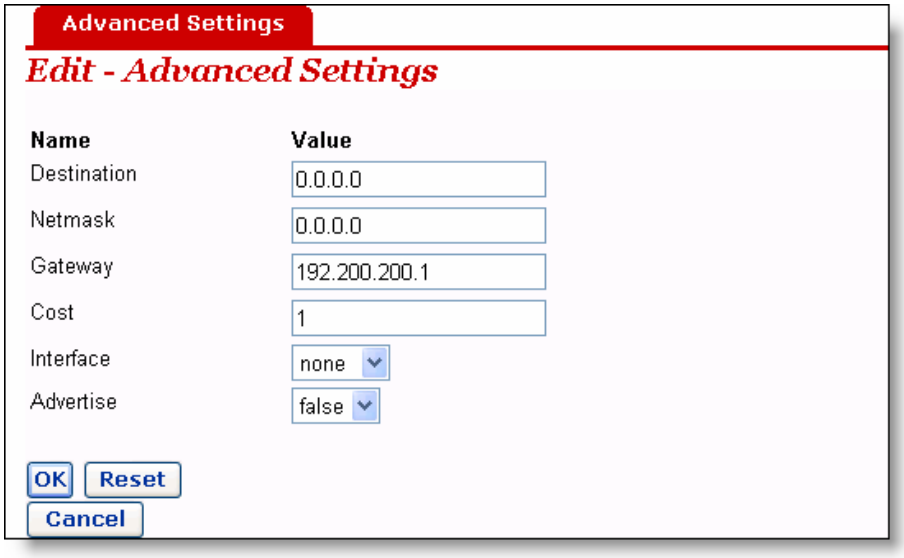


Figure 5-36 Advanced Settings page

To delete an existing route, select the corresponding [Delete?] check box in Figure 5-35 and click <Apply>.

To add a new route, click <Create new Ip V4Route…> in Figure 5-35 to enter the [IP V4Route] page. Type in the related values of route options, and then click <OK>.Click <Cancel> to cancel the settings and return to the route configuration page.

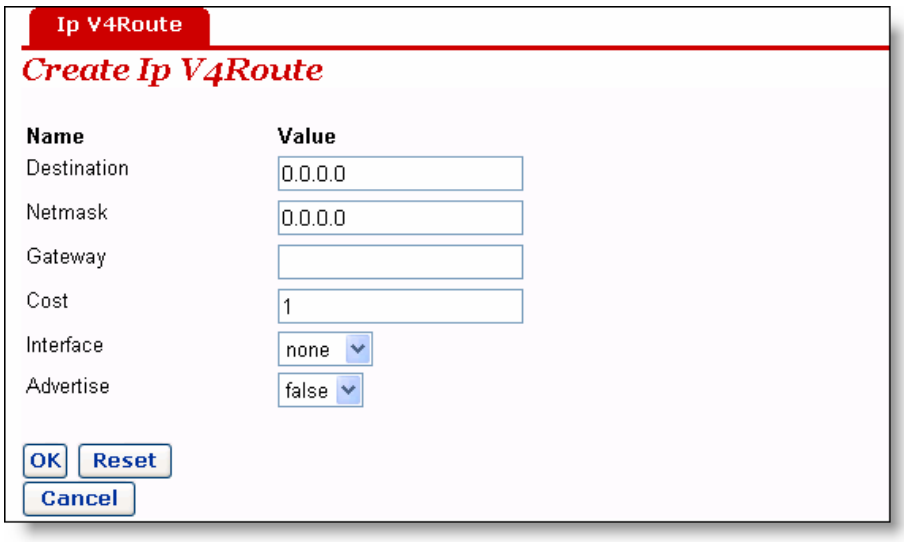


Figure 5-37 Create a route

Caution:

For DHCP or Static IP services, you must type in the next hop address in the [Gateway] filed (you cannot leave it blank), while you can set the [Interface] drop-down list to the default (None) or other value.

For other services (IPoA, PPPoA, and PPPoE), you can specify a value of either the interface or the gateway. If both of them are specified, only the interface value takes effect.

Example: Figure 5-38 illustrates a physical connection that requires static routes.

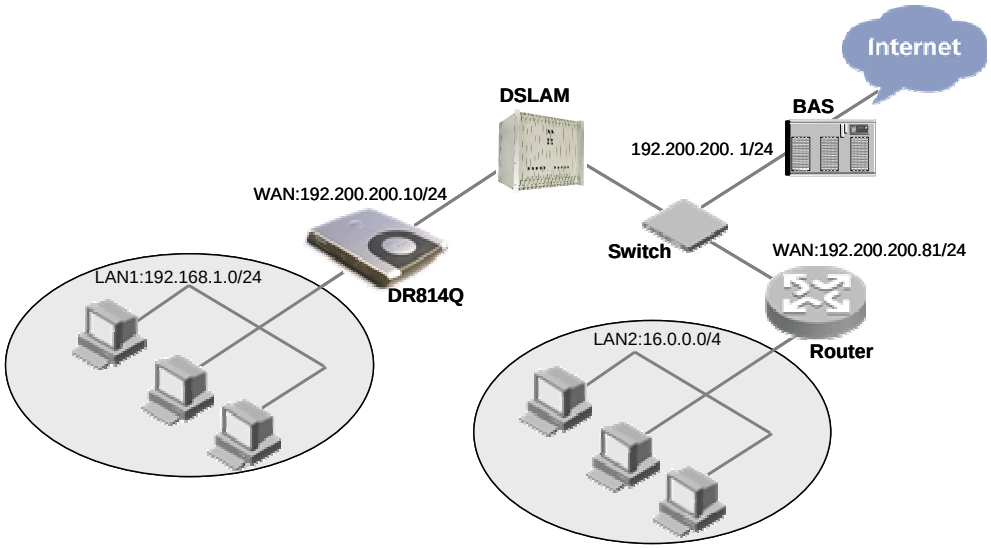


Figure 5-38 Network diagram for the static route configuration

In Figure 5-38, suppose that a DHCP service is configured for the DR814Q, the gateway address is 192.200.200.1, and there is a default route to broadband access server (BAS).A router is connected to another network segment, LAN2 (16.0.0.0/4), on the WAN side, and the IP address of the WAN port is 192.200.200.81.To make hosts in LAN1 access hosts in LAN2 normally, you need to create a route as below so that the DR814Q can choose routes for packets correctly.

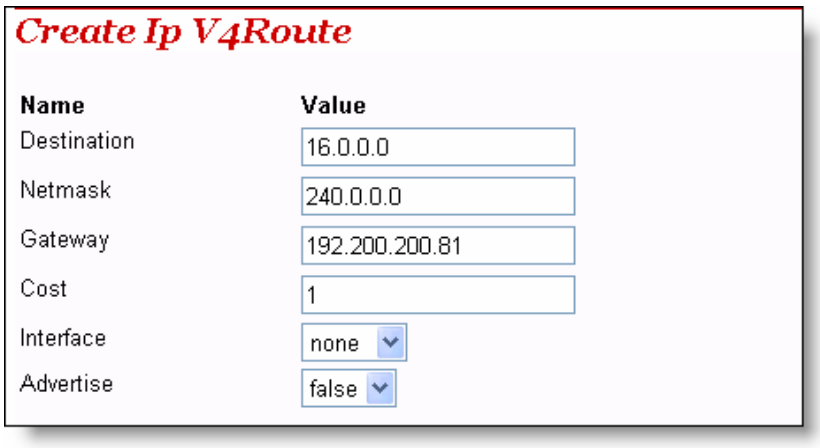


Figure 5-39 Example of the static route configuration

5.5 Service

Two tabs, SNTP and ZIPB, are available on the [Service] page. Click any tab to enter the corresponding configuration page.

5.5.1 SNTP

Configure the DR814Q as an SNTP client and thus you can obtain accurate time/date information from the corresponding SNTP server. If your router is not connected to the SNTP server, you can set the time/date on the DR814Q instead.

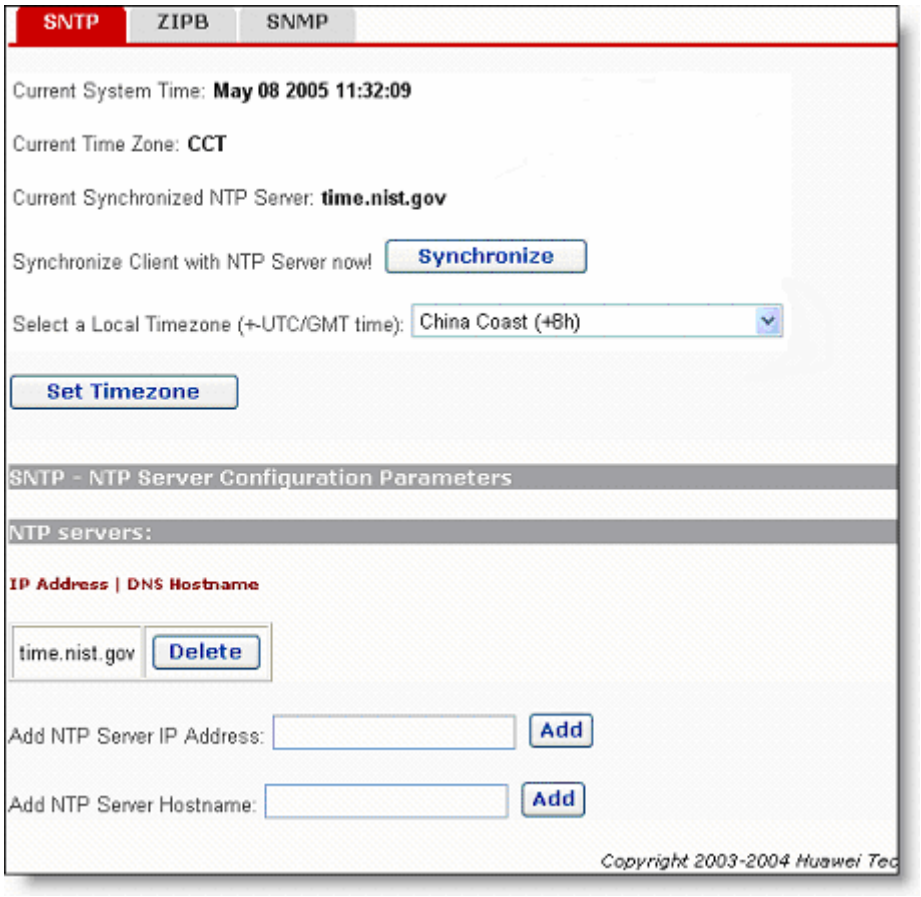


Figure 5-40 SNTP configuration

This page allows you to:

- View the current system time configuration
- Set the time zone
- Configure the NTP server on the Internet to make the clock of the DR814Q synchronize its internal clock.

To synchronize the local time of the router with the SNTP server, click <Synchronize>.

To set the time zone, select a desired option from the corresponding drop-down list and then click <Set Timezone>.

To add an NTP server, type in the IP Address or the domain name of the SNTP server in the [NTP servers:] field, and then click <Add>.

To delete an existing NTP server, click the corresponding <Delete> button.

5.5.2 ZIPB

ZZIPB (zero installation PPP bridge) can ensure that a SOHO user can obtain a public IP address through the router, and to resolve the problem that all SOHO routers with NAT enabled cause part of the application unable to function normally.

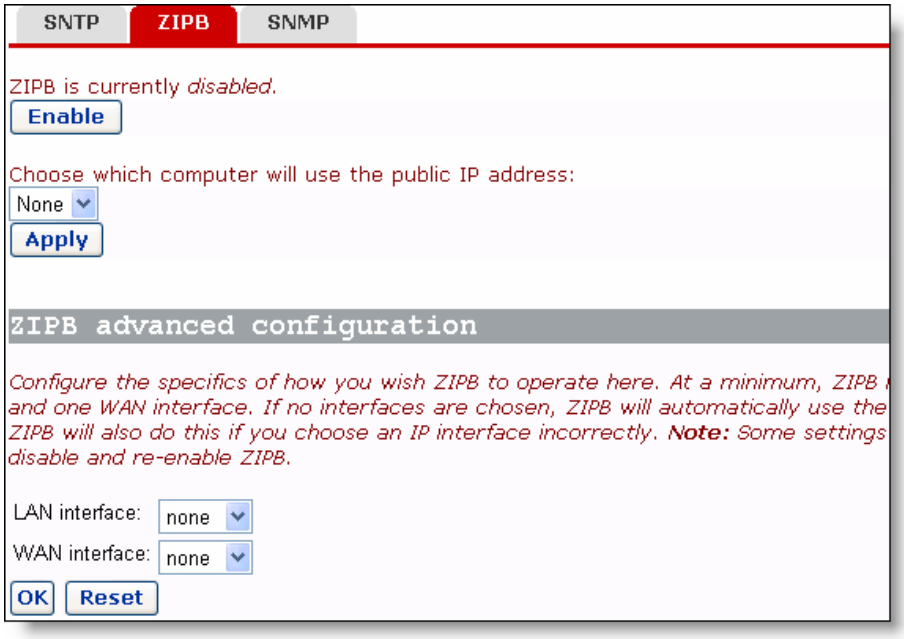


Figure 5-41 ZIPB configuration

This page allows you to:

- Enable/disable the ZIPB mode
- Specify the ZIPB host
- Perform advanced ZIPB configuration.

If the ZIPB is currently disabled, click <Enable> to enable it. If enabled, click <Disable> to disable it.

Select the PC that will use the public IP address in the current LAN from the drop-down list, and then click <Apply>.

To perform advanced ZIPB configuration, follow these steps:

- Select the LAN interface on which ZIPB will run from the [LAN interface] drop-down list.
- Select the WAN interface on which ZIPB will run from the [WAN interface] drop-down list.

Click <OK> after the ZIPB configuration is complete.

Caution:

- Make ensure that ZIPB is disabled before you change the ZIPB configuration. Change the configuration, and then click <OK>. The new configuration will take effect after you enable ZIPB.Any change on the configuration takes no effect when the ZIPB is enabled.
- Configuration changes on ZIPB will not be saved, and so you need to reconfigure it whenever the router restarts. That is, make the previous ZIPB host obtain the IP address again through DHCP, and then specify a new ZIPB host from the drop-down list
- You can enable ZIPB only for two WAN services: PPPoE and PPPoA.

5.5.3 SNMP

The DR814Q supports simple network management protocol (SNMP) proxy function, exchanging SNMP information with the network management sites through SNMP.

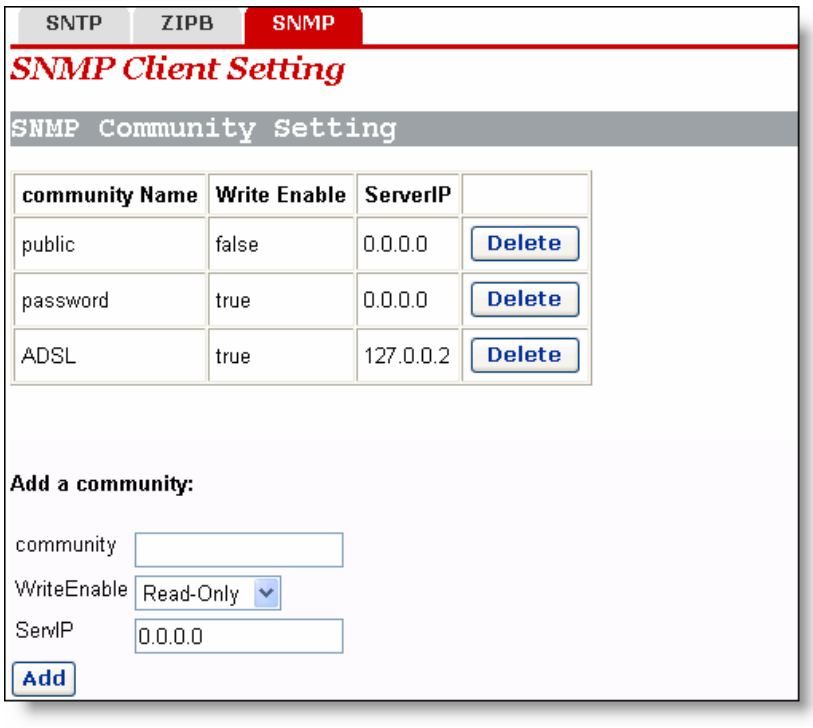


Figure 5-42 SNMP Client Setting page

You can create an SNMP community in Figure 5-42 and this community will be displayed in the community list. The DR814Q authenticates the SNMP packets according to the defined information in the list.

To add a community, refer to the following information to perform the settings, and then click <Add>.

- community: Type in the community name, uniquely identifying an SNMP community. The packets mismatching the community name are discarded.
- WriteEnable: Specify the access right for the community. If **Read-Only** is selected, this community can only view the DR814Q information; if Read-Write is selected, this community can view or modify the DR814Q information.
- ServIP: Specify the IP address of the management site sending SNMP packets. It is recommended that you keep the default setting 0.0.0.0, which indicates the source IP address sending the SNMP packets is not restricted.

To delete the current community, click the corresponding <Delete>.

6 Troubleshooting

This chapter gives solutions to problems you may encounter when installing or using the DR814Q, and provides instructions for using several IP utilities to diagnose problems. Contact Customer Support if these suggestions do not resolve the problems.

6.1 DR814Q Troubleshooting

Symptom 1: The power LED does not illuminate.

Solution: Check whether:

- The power adapter that comes with the DR814Q is used.
- The power adapter is securely connected to the DR814Q and the power socket.

Symptom 2: The ADSL2+ Link LED does not illuminate after the telephone cable is connected.

Solution: Check whether the telephone cable is securely connected to the ADSL port and the telephone port.

Symptom 3: The LAN LED does not illuminate after the Ethernet cable is connected.

Solution: Check whether:

- The power connection is good.
- The Ethernet cable is securely connected to the port.
- The correct cable is used. To check this, connect two ends of the cable to the LAN ports of the DR814Q, observe whether the corresponding LED illuminates. If not, change the cable and follow the steps described in section 2.3 “Device Connection” to set up the connection.
- The PC has an Ethernet NIC installed correctly.

Symptom 4: You forget your password.

Solution: If you have not changed the password, use the default user name (**admin**) and password (**admin**).Press the Reset button for at least five seconds to restore the default settings on the DR814Q.Then you can use the default user name and password.

Caution:

Resetting the DR814Q removes all the customized settings and restores the default ones.

Symptom 5: Fail to access the Web configuration page.

Solution: Follow the procedures to check whether:

1) The version of the Internet Explorer is Microsoft Internet Explorer 5.5 or Netscape 6.0 or later.
2) PC and the DR814Q are in the same network segment.
3) Use the **ping** command in an MS-DOS window to check the network connectivity:

- Ping 127.0.0.1 to see if the TCP/IP protocol is installed.
- Ping 192.168.1.1 (the default IP address of the gateway) to check for the connection between the PC and DR814Q in the LAN.

4) If the physical connections are normal, but you still cannot access the Web configuration pages of the DR814Q, make sure the proxy server and the dialup connection are disabled.

Symptom 6: Fail to access the Internet with your PC.

Solution: Follow the procedure:

5) Check whether the ADSL2+ Link LED is solid ON. If not, check the ADSL line connection.
6) Check whether the IP address is obtained and you can ping the IP address of the DR814Q's LAN port if you configure the PC to obtain the IP addresses of the host and the DNS server automatically (recommended). Refer to section 6.2.1 "Ping" for instructions on how to use the ping utility. If you cannot ping the port, check if the Ethernet cable is correct.
7) When the current PC is specified with a private IP address, make sure that: The PC resides in the same segment as that of the DR814Q's LAN port. The IP address of the gateway is specified as that of the DDR814Q's LAN port. The IP address of the DNS is specified as that of the DR814Q's LAN port or the DNS Server the ISP allocates. The host is able to ping the IP address of the DR814Q's LAN port.
8) When the host can communicate with the DR814Q normally, but cannot connect to the Internet, log into the [Status] page of the DR814Q (refer to section 4.5 "Status") first, and check to see if the WAN port of the DR814Q has obtained the Internet IP address and if the default route exists.

Symptom 7: You cannot access the Web pages through the PC in the LAN.

Solution: Follow the procedure to check:

9) The DNS server IP address specified on the PC is correct. If you specify the PC to obtain the DNS server address dynamically, verify with your ISP that the address configured on the DR814Q is correct, and then you can use the ping utility to test the connectivity with your ISP's DNS server.
10) Generally, if a host can ping the Internet IP address, but cannot open the Web pages, the DNS server of the ISP is experiencing a failure temporarily. In this case, you can choose either of the following to solve the problem: Manually change your PC's DNS IP address to the address of a normally functioning DNS server. Log into the Web page of the DR814Q and manually modify the configuration for DNS Relay (refer to section 4.2.2 "DNS Relay"), and then check by the **nslookup** command as instructed in section 6.2.2 "Nslookup".

Symptom 8: Fail to save the changes made on the Web configuration pages.

Solution: Make sure that you click <Apply> to confirm every change you have made. After completing all the settings, enter the [Save Configuration] page to save them, thus making them take effect when the DR814Q is powered on next time.

Symptom 9: You can access most of the websites, but sometimes connection to some websites times out. When you set the DR814Q to operate in the bridge mode and your PC to establish a dialup connection, you can access the websites normally. How does this problem come?

Solution: This problem is due to the MTU value from the client to the DR814Q. It is set too large. To solve the problem, enter the specific editing page (refer to section 4.2.1 "WAN") to change the MTU value to a smaller one, such as 1440, and then select **true** from the [TCP MSS Clamp] drop-down list.

In addition, if you fail to send an E-mail in the LAN, but succeed when you change an SMTP server, or you fail to transfer files by the point-to-point communication software, but succeed in transferring photos with other friends, this may be caused by the settings of the MTU for the LAN interface if you are sure the server functions well. Enter the [LAN Connections] tab page (refer to section 4.3.1 "LAN") to change the MTU value to a smaller one, such as 1440, and then select **true** from the [TCP MSS Clamp] drop-down list.

Symptom 10: Some services are unavailable once the firewall is enabled.

Solution: As the firewall rules of the DR814Q are very strict, it is recommended someone familiar with the WAN services and router configuration enable the firewall and configure the firewall rules. Before the creation of firewall rules, you must be clear about the Internet service deployment. It is recommended that you disable the firewall.

6.2 Diagnosis Tools

6.2.1 Ping

Use the **Ping** command to check whether your PC can recognize other computers on the network. A **ping** command sends messages to the specified computer. If the computer receives the messages, it replies with the response message. Before using the command, you must know the IP address of the destination host with which your PC is trying to communicate.

At the DOS prompt, enter the following command:

ping 192.168.1.1

If the destination host receives the packet, the command prompt window displays the contents as shown in Figure 6-1.

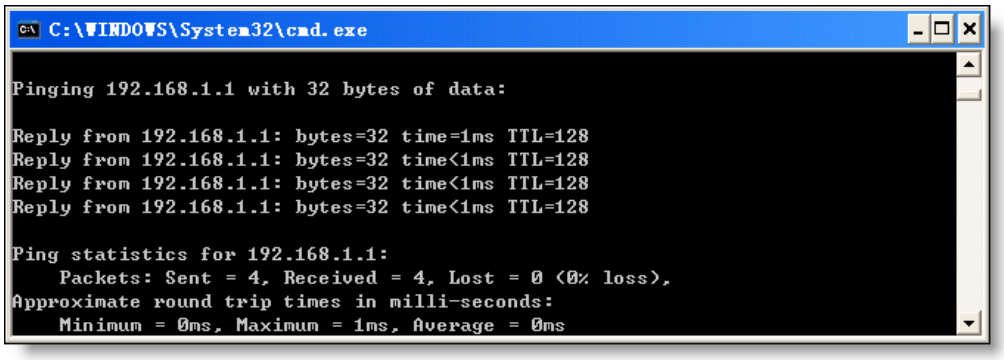


Figure 6-1 Use the **ping** command – the ping succeeds

If the destination PC is not reachable, the Request timed out message is displayed as follows:

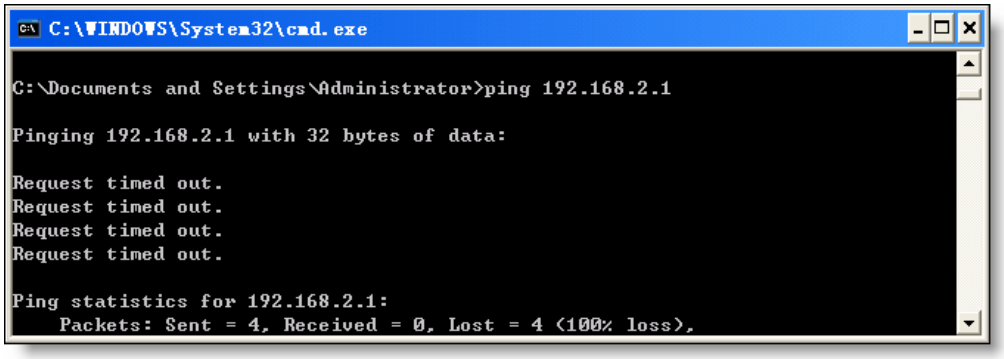


Figure 6-2 Use the **ping** command – the ping fails

To check the connectivity with the DR814Q, use the **Ping** command with the default IP address of the LAN port (192.168.1.1) or the address you assign.

To check the connectivity with the Internet, enter an Internet domain name, such as **www.yahoo.com** (216.115.108.243).If you want to look up the IP address of a website, use the nslookup command as instructed in section 6.2.2 “Nslookup” for details.

For other operating systems running the IP protocol, you can enter the same ping command at a command prompt or through a system administration utility.

6.2.2 Nslookup

The **nslookup** command is used to query the IP address associated with a domain name. You can specify the common domain name and use the **nslookup** command to look up in the DNS server (usually located though your ISP).If that name is not in your ISP’s DNS table, the request is then sent to a higher-level server until the name is found. The server then returns the associated IP address.

On Windows-based computer, you can execute the **nslookup** command from the [Start] menu. Choose [Start/Run] and in the open text box type the following:

nslookup

Click <OK> and a command prompt window appears. The [Command Prompt – nslookup] window is displayed with a bracket prompt (>).At the prompt, type the domain name of the desired Website, for example **www.microsoft.com**.

The window displays the associated IP address as shown below.

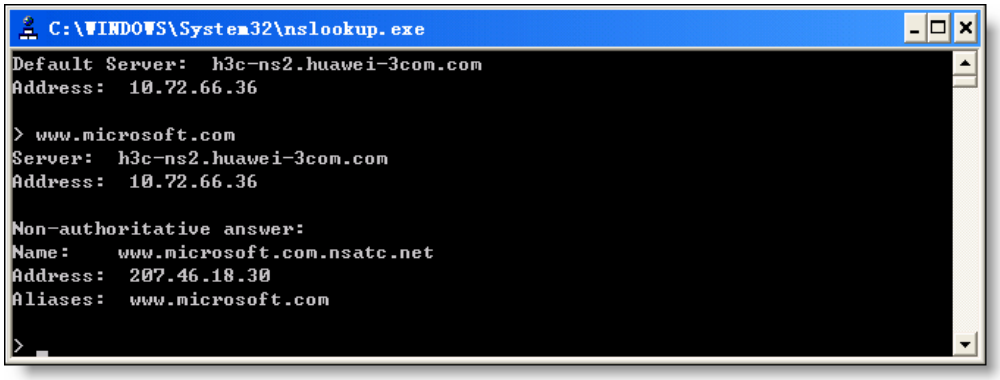


Figure 6-3 Use the **nslookup** command

Some websites with heavy traffic use multiple servers to carry the same information. So it is common to have several IP addresses associated with one Internet domain name.

To exit from the nslookup utility, enter **exit**.

7 Appendix - TCP/IP Protocol

7.1 Installing TCP/IP

The PC through which you configure your DR814Q must have the TCP/IP installed. If you are not sure whether TCP/IP is installed, follow these steps.

⚠ **Caution:**

By default, TCP/IP is installed on Windows 2000/XP. The following steps are described for the Windows 98/ME/NT.

---

1) Choose [Start/Settings/Control Panel].
2) Double-click the Network Connection icon to open the [Network] dialog box and select the [Configuration] tab (see Figure 7-1).
3) Check the list on the [Configuration] tab page to see if the item that contains both the TCP/IP and the name of the NIC you are currently using exists. If not, click <Add> to open the [Select Network Component Type] dialog box (see Figure 7-1).

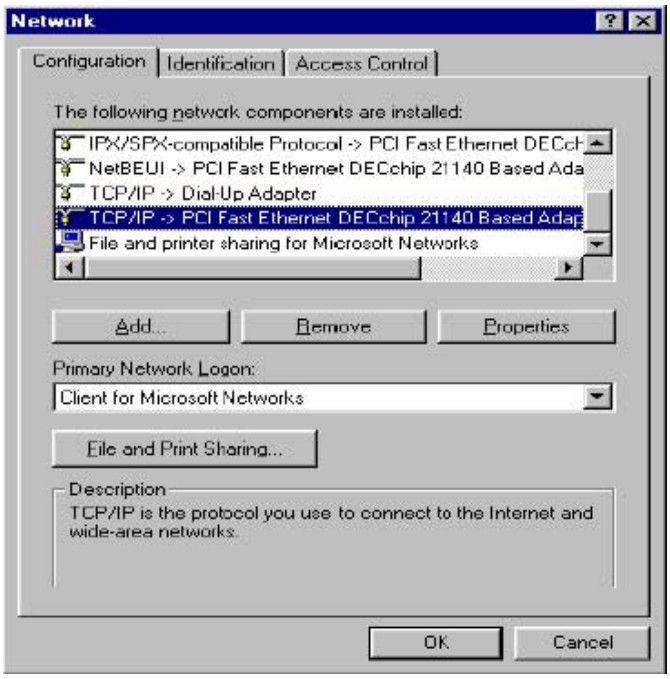


Figure 7-1 Network dialog box

4) Double-click **Protocol** from the list of [Select Network Component Type] dialog box (or click **Protocol** and then click <Add…>) to open the [Select Network Protocol] dialog box (see Figure 7-2).

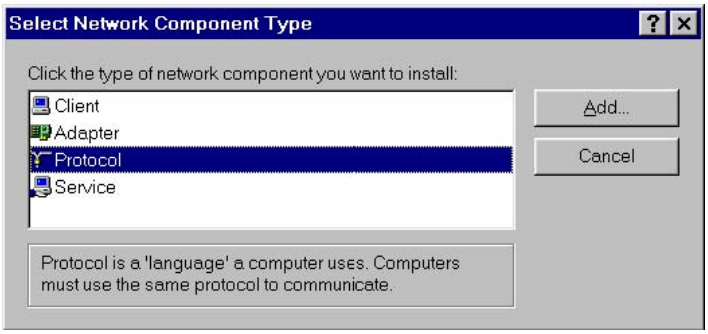


Figure 7-2 Select Network Component Type dialog box

5) Select **Microsoft** from the Manufacturers list in the [Select Network Protocol] dialog box, double-click **TCP/IP** in the Network Protocols list (or click **TCP/IP**, and then click <OK>) to return to the [Network] dialog box. Then you can see the TCP/IP item in the section listing the installed network components.

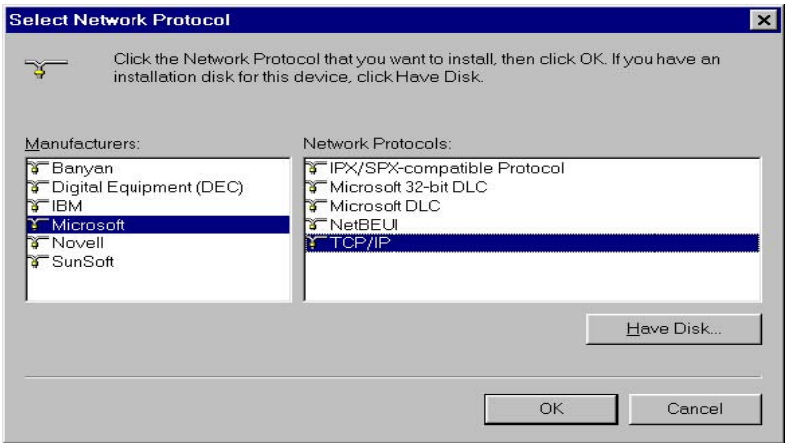


Figure 7-3 Select Network Protocol dialog box

6) Click <Properties> in the [Network] dialog box to open the [TCP/IP Properties] dialog box (see Figure 7-4).Select the [IP address] tab and select the **Obtain an IP address automatically** option. Click <OK> and restart your PC to complete the TCP/IP installation.

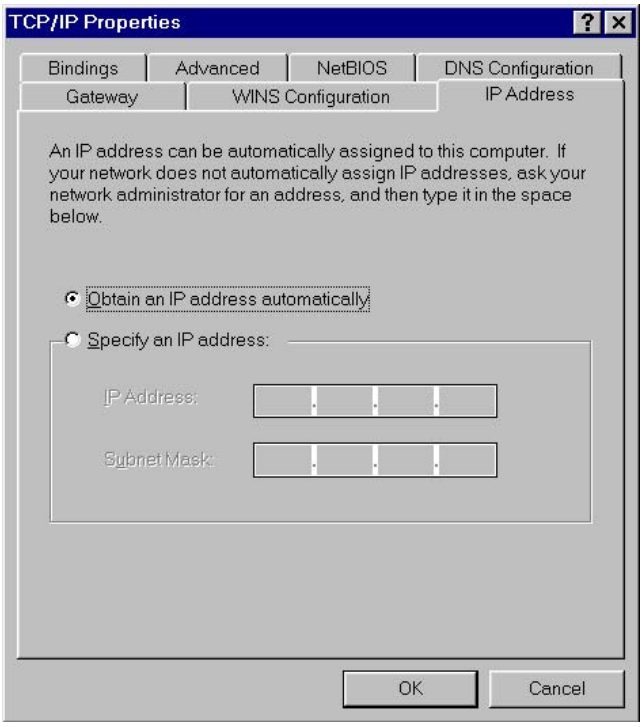


Figure 7-4 TCP/IP Properties dialog box

7.2 Configuring TCP/IP

7.2.1 Specifying to Obtain an IP Address Automatically

If you are running Windows 98/ME/NT, refer to those described in section Figure 7-3 to specify to obtain an IP address automatically. If you are running Windows 2000/XP, perform the following operation.

1) Choose [Start/Settings/Control Panel] to open the [Control Panel] dialog box. Double-click the Network Connection icon to open the [Network Connection] dialog box and then double-click the Local Connection icon to open the [Local Area Connection Status] dialog box (see Figure 7-5).

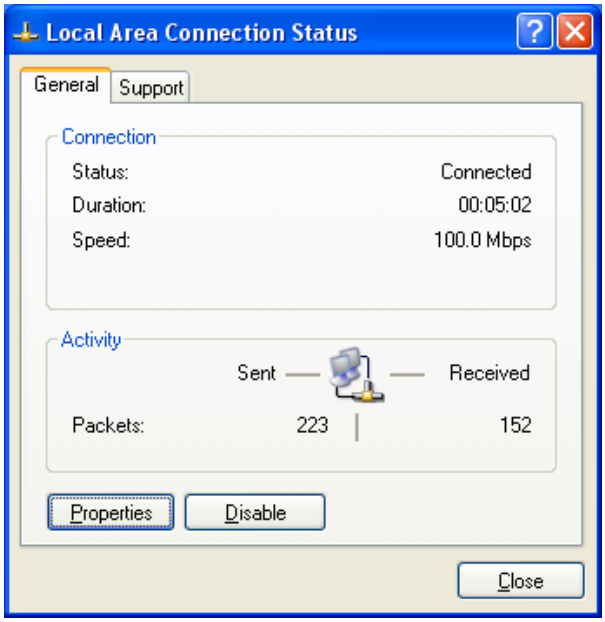


Figure 7-5 Local Area Connection Status dialog box

2) Click <Properties> to open the [Local Area Connection Properties] dialog box (see Figure 7-6). Select the [General] tab and select **Internet Protocol (TCP/IP)** in the [This connection uses the following items:] section, and then click <Properties> to open the [Internet Protocol (TCP/IP) Properties] dialog box as shown in Figure 7-7.

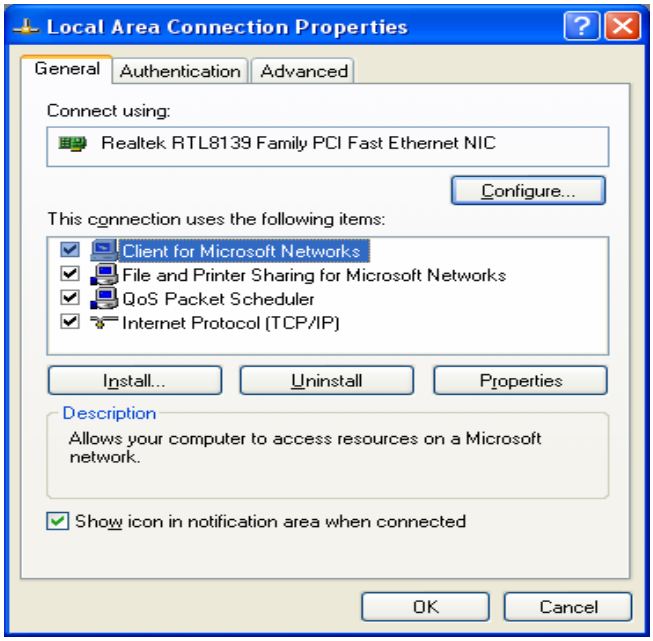


Figure 7-6 Local Area Connection Properties

3) On the [General] tab page of the [Internet Protocol (TCP/IP) Properties] dialog box select the **Obtain an IP address automatically** option and click <OK>.

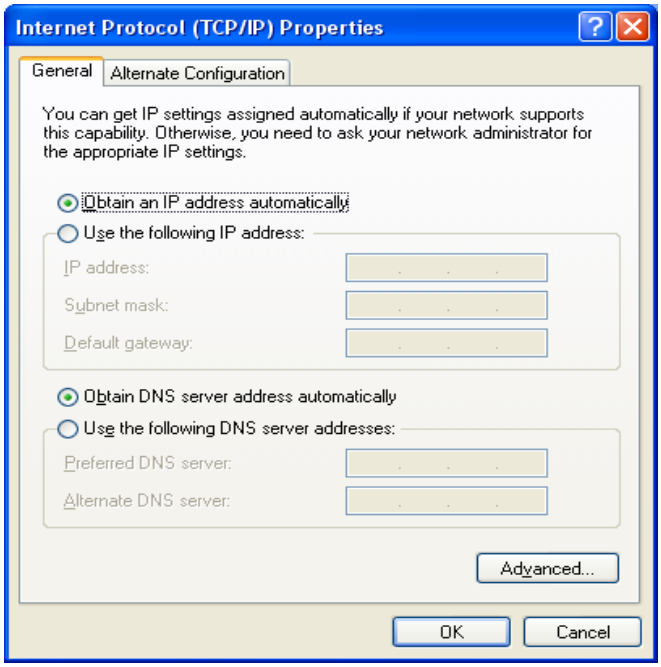


Figure 7-7 Internet Protocol (TCP/IP) Properties dialog box

7.2.2 Specifying a Fixed IP Address

Since the DR814Q enables the DHCP by default, the PCs in the LAN can obtain related information dynamically, thus there is no need to assign static IP addresses for PCs in

the LAN. But in some cases you still need to configure network settings for some or even all the PCs on a network.

By default, the IP address of the Ethernet port of DR814Q is 192.168.1.1. Choose any from 192.168.1.2 to 192.168.1.254 to make your PC in the same segment with 192.168.1.1/24. Follow the procedure suitable for your operating system to specify IP addresses.

1) Specify the IP address of your PC.

- Windows 98/ME/NT: In the [TCP/IP Properties] dialog box (see Figure 7-4), select the [IP Address] tab and select the Specify an IP address option.
- Windows 2000/XP: In the [Internet Protocol (TCP/IP) Properties] dialog box (see Figure 7-7) select the [General] tab, and then the **Use the following IP address** option. Type in the IP address and subnet mask in the corresponding fields and click <OK>.

2) Specify the IP address of the gateway.

- Windows 98/ME/NT: In the [TCP/IP Properties] dialog box (see Figure 7-4) select the [Gateway] tab. Type in the default IP address of your DR814Q (**192.168.1.1**) in the [New gateway] text box and click <Add>.
- Windows 2000/XP: In the [Internet Protocol (TCP/IP) Properties] dialog box (see Figure 7-7), select the [General] tab. Type in the default IP address of your DR814Q (**192.168.1.1**) in the [Default gateway] text box and click <OK>.

3) Specify the IP address of the DNS server.

- Windows 98/ME/NT: In the [TCP/IP Properties] dialog box (see Figure 7-4), select the [DNS configuration] tab and type in the default IP address of your DR814Q (**192.168.1.1**) as the DNS server IP address in the corresponding field.
- Windows 2000/XP: In the [Internet Protocol (TCP/IP) Properties] dialog box (see Figure 7-7) click <Advanced…> to open the [Advanced TCP/IP Configuration] dialog box. Select the [DNS] tab and click <Add…>. Type in the default IP address of the DR814Q (**192.168.1.1**) in the [DNS server] field and click <Add>.

4) Making the settings take effect.

- Windows 98/ME/NT: Click <OK> and restart your PC for the above settings to take effect.
- Windows 2000/XP: Click <OK> to make the above settings to take effect.

8 Appendix - USB Configuration

8.1 Installing USB Driver

Make sure the USB function of your PC operates properly.

The Microsoft Windows 98/98 SE/ME/2000/XP supports USB driver. The following installation procedure is based on Windows XP. Use it for reference when running any other operating system.

I. Insert the driver CD into the CD-ROM of your PC.

The CD that comes with the DR814Q contains the USB driver.

II. Plug one end of the USB cable into the USB port of the DR814Q, and the other into the USB port of your PC.

The USB cable has a rectangular Type A connector on one end and a square Type B connector on the other end. Connect the Type A to your PC and the Type B to the DR814Q.

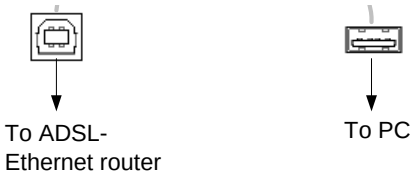


Figure 8-1 USB cable connector

III. The [Found New Hardware Wizard] dialog box appears (see Figure 8-2). Select the Install the software automatically (Recommended) option and click <Next> to proceed.

Figure 8-2 Find new hardware

IV. The PC searches the CD for the driver configuration file.When this file is found, the PC begins to install the driver.

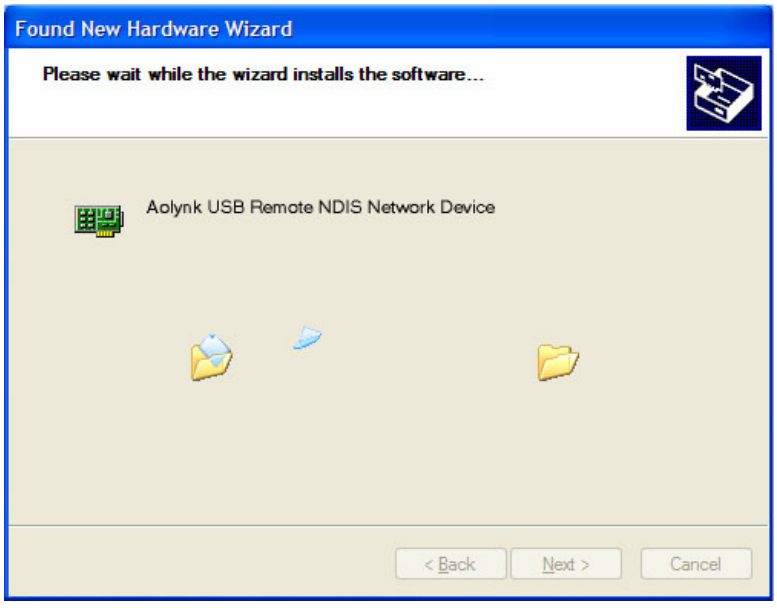


Figure 8-3 Install software

The dialog box (see Figure 8-4) appears during installation, warning that the device is not compatible with Windows XP. Just click <Continue Anyway> to proceed. Microsoft logo test

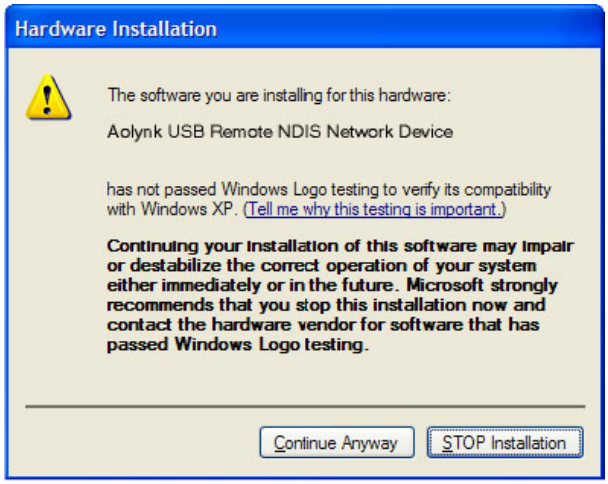


Figure 8-4 Microsoft logo test

V. The dialog box (see Figure 8-5) indicates the installation is complete. Click <Finish> to exit the installation.

Figure 8-5 Complete the installation

8.2 Configuring IP Properties

After the USB driver installation is complete, you must configure the PC to place it in the same subnet as the DR814Q USB port. Two options are available to configure the IP properties:

- Your DR814Q can be a DHCP server to assign IP addresses to PCs in the LAN, so you can specify your PC to obtain IP address automatically. Refer to section 7.2.1 “Specifying to Obtain an IP Address Automatically” for detailed information.
- If you want to specify a fixed IP address to the PC, follow the instructions in section 7.2.2 “Specifying a Fixed IP Address” and use the following information..

The USB port on the DR814Q is preconfigured with these properties:

IP address: 192.168.1.1

Subnet mask: 255.255.255.0

Therefore, your PC should be configured as the following:

IP address: 192.168.1.n (n is an integer ranging from 2 to 254)

Subnet mask: 255.255.255.0

9 Appendix - IP Address and Subnet Mask

9.1 IP Address

Note:

- This section refers to the IP address of IPv4 (version 4 of the Internet Protocol) only and the IP address of IPv6 is not covered.
- This section describes the basic knowledge of binary numbers, bits, and bytes.

An IP address, like the telephone number on the Internet, is used to identify the individual node (a PC or network device) on the Internet. Every IP address contains four sets of numbers, each from 0 to 255 and separated by dots, for example 20.56.0.211.These numbers are called, from left to right, field 1, field 2, field 3, and field 4.

The representation of four sets of digits separated by dots for IP address is called dotted decimal notation.

9.1.1 Structure of the IP Address

Like a telephone number, the IP address contains two components. For instance, the first three digits of a seven-digit telephone number identify a group with thousands of telephone lines, while the last four digits identify a specific line in this group.

Similarly, an IP address contains two components:

- Network ID

Identify a specific network segment on the Internet or the intranet.

- Host ID

Identify a specific PC or device on the segment.

The starting part of every IP address is the network ID and the rest is the host Dither length of the network ID depends on the class of the network (refer to section 9.1.2 “Classes of IP Addresses”). Table 9-1 describes the structure of the IP address.

Table 9-1 Structure of the IP address

Class	Field 1	Field 2	Field 3	Field 4
Class A	Network ID	Host ID		
Class B	Network ID		Host ID	
Class C	Network ID			Host ID

The following are some valid IP address examples:

Class A: 10.30.6.125 (network ID = 10, host ID= 30.6.125)

Class B: 129.88.16.49 (network ID = 129.88, host ID = 16.49)

Class C: 192.60.201.11 (network ID = 192.60.201, host ID = 11)

9.1.2 Classes of IP Addresses

Three common IP addresses are of Cass A, B, and C. (Class D is for special use and is beyond the scope of this discussion.) These classes have different uses and characteristics.

The class A network is the largest on the Internet. This allows at least 16 million hosts per network. Such 126 class A networks can hold at least two billion PCs. These enormous networks are quite suitable for the LAN or Internet fundamental organizations such as Internet service provider (ISP).

The class B network is relatively smaller than the class A network, but it still allows 16,384 class B networks and 65,000 hosts in each class B network. This kind of network is suitable for the large organizations such as enterprises and governments.

The class C network is the smallest one. It allows over two million (2,097,152 exactly) class C networks and 254 hosts in each class C network. The LANs connecting to the Internet are usually of this class networks.

Following are the key points about the IP address:

- The easiest way to determine the class of an IP address is to look at its number in the field 1:

  Class A: The number is from 1 to 126.

  Class B: The number is from 128 to 191.

  Class C: The number is from 192 to 223.

(The numbers for special use are not given here.)

- Not all the fields of a host ID can be 0s or 255s as these numbers are reserved for special use.

9.2 Subnet Mask

Note:

A network mask looks like a regular IP address and a subnet mask can tell the division of the network ID and the host ID: A bit set to 1 means this bit is part of the network ID and a bit set to 0 means this bit is part of the host ID.

Subnet masks are used to define subnets (subnets are smaller segments of a large one). A subnet number is a number of bits borrowed from the host portion of IP address.

For example, to divide a Class C address 192.168.1.1 into two subnets, you need to set the subnet mask as follows:

255.255.255.128

It is much more straightforward to define the address in binary notation.

11111111. 11111111. 11111111.10000000

For any Class C address, all the bits in the filed 1 through field 3 are part of the network ID, but note how the mask specifies that the first bit in field 4 is also included. Since this extra bit has only two values (0 and 1), this means there are two subnets. Each subnet uses the remaining 7 bits in field 4 for its host IDs, which range from 1 to 126 hosts (instead of the usual 0 to 255 for a Class C address).

Similarly, to divide a class C network into four subnets, set the mask as follows:

255.255.255.192 or 11111111. 11111111. 11111111.11000000

The two extra bits in field4 can have four values (00, 01, 10, and 11), so there are four subnets. Each subnet uses the remaining six bits in field 4 for its host IDs, ranging from 1 to 62.

Note:

Sometimes a subnet mask does not specify any additional network ID bits, and thus no subnets exist. Such a mask is called a default subnet mask. These masks are:

- Class A: 255.0.0.0
- Class B: 255.255.0.0
- Class C: 255.255.255.0

They are so called because they are used for an initially configured network without subnets.

10 Appendix - Technical Specifications

Table 10-1 Technical specifications

Item	Description
Ports and buttons	Four 10/100Base-TX Ethernet ports One ADSL port One USB port One Reset button to restore the factory default settings
Power consumption	< 12W
Power supply (external)	12 VDC, 1 A
Physical dimensions (H x W x D)	31.5 × 193 × 123 mm (1.2 × 7.6 ×4.8 in.)
Weight	Approximately 310g (11 oz)
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	–10°C to +70°C (14°F to 158°F)
Operating humidity (noncondensing)	20% to 85%
Storage humidity (noncondensing)	10% to 90%
Certification	FCC Class B CE

11 Appendix - Glossary

100Base-TX

Category 5 twisted pair cable with the maximum transmission distance of 100 meters (328 ft) and maximum transmission rate of 100 Mbps.

10Base-T

Category 3/4/5 twisted pair cable with the maximum transmission distance of 150 meters (492 ft) and the maximum transmission rate of 10 Mbps.

ADSL

Asymmetric digital subscriber line. The most popular flavor of DSL for home users. The term asymmetrical refers to its unequal data rates for download and upload (the download rate is higher than the upload rate).The asymmetrical rate benefits home users because they typically download much more data from the Internet than they upload.

ATM

Asynchronous transfer mode. A technology that uses fixed length packets, called cells, for the packet-switched network. The cell, consisting of a cell header and the text, are switched over a public or private ATM network. The individual ATM segments in the ATM switch cross connect to each other, forming the end-to-end connection.

Binary

The binary number system just uses two digits, 0 and 1, to represent all the numbers. In this system, the decimal digit 1 is represented by 1, 2 by 10, 3 by 11, 4 by 100, and so on. Although it is convenient to express numbers in decimal, the IP addresses actually use binary numbers. For instance, the IP address 209.191.4.240 is converted into 11010001.10111111.00000100.11110000 in binary.

Bridging

The data is sent from your network to your ISP and in return your ISP sends the data to the devices on the network by the physical addresses. Compared with routing, bridging makes it more intelligent to transfer data by using network addresses. DR814Q can

perform both routing and bridging. When both functions are enabled, the DR814Q routes IP data and bridges all the other types of data.

Broadcast

A technology used to send data to all the computers on a network.

DHCP

Dynamic host configuration protocol. DHCP automates IP address assignment and management. When a PC connects to the LAN, DHCP assigns it an IP address from a shared address pool, and after a specified period, DHCP returns the address to the pool.

DHCP server

Dynamic host configuration protocol server. A DHCP server is a computer responsible for assigning IP addresses to the computers in a LAN.

DNS

Domain name system. The DNS translates domain names into IP addresses. DNS information is distributed hierarchically throughout the Internet among the computers called DNS servers. For example, **www.yahoo.com** is the domain name associated with the IP address 216.115.108.243.When you start to access a website, a DNS server looks up the requested domain name and searches for its corresponding IP address. If the DNS server cannot find the IP address, it communicates with higher-level DNS servers to determine the IP address.

Domain name

A domain name is a user-friendly name in place of its associated IP address. A domain name must be unique and is controlled by the Internet Corporation for Assigned Names and Numbers (ICANN).A domain name is a key element of a URL which identifies a specific file at a website.

DSL

Digital subscriber line. A technology that allows both digital data and analog voice signals to travel over the existing copper telephone lines.

Ethernet

The most commonly installed computer network technology, usually using the twisted pair cables. The Ethernet data rates are 10 Mbps and 100 Mbps.

Firewall

A firewall can protect your computer or LAN from malicious attacks and other unexpected accesses. Unauthorized users may attempt to attack your network in order to prevent you or others on your LAN from the services.

Using the firewall, you can block certain types of IP traffic commonly used by hackers to protect your network. You can also restrict the types of IP traffic sent from your network to the outside. Some firewall protection can be provided by packet filtering and network address translation services.

FTP

File transfer protocol. A program used to transfer files between computers connected to the Internet. Common uses include uploading new or updated files to a Web server, and downloading files from a Web server.

HTTP

Hypertext transfer protocol. It is the main protocol used to transfer data between websites so that it can be displayed by Web browser.

Hub

A hub receives the data from devices and forwards them. It usually performs the switching function by connecting a device such as an Ethernet bridge or a router to a group of computers in a LAN and allowing communication between those devices.

ICMP

Internet control message protocol. An Internet protocol used to report errors and other network-related information. The **ping** command makes use of ICMP.

IEEE

Institute of Electrical and Electronics Engineers. It is a technical professional society that fosters the development of standards that often become national and international standards.

IP address

Internet protocol address. The address of a host (computer) on the Internet, consisting of four decimal numbers, each from 0 to 255, separated by dots, such as 209.191.4.240.An IP address consists of a network ID that identifies the particular network the host belongs to, and a host ID uniquely identifying the host itself on that network. A network mask is used to define the network ID and the host ID. Because IP addresses are difficult to remember, they usually have an associated domain name that can be specified instead.

ISP

Internet service provider. A company that provides Internet access and charges the customers for services.

LAN

Local area network. A network limited to a small geographic area, such as a home, office, or small building.

MAC

Media access control address. It is the permanent hardware address of a device, assigned by its manufacturer. MAC addresses are expressed as six pairs of two hexadecimal digits, separated by hyphens, such as 00-0F-1F-80-65-25.

MTU

Maximum transmission unit. It is the largest frame size that is transmitted over the physical network.

NAT

Network address translation. This enables computers in a LAN to access the Internet by sharing the same IP address. When a computer accesses the Internet, its private IP address is translated into a public address of the WAN port.

Network mask

A network mask is a sequence of bits applied to an IP address to select the network ID. Select the bit set to 1 and ignore the bit set to 0.For example, if the network mask 255.255.255.0 is applied to the IP address 100.10.50.1, the network ID is 100.10.50, and the host ID is 1.

NIC

Network interface card. An adapter provides the physical interface for your network cabling. The Ethernet NIC usually has an RJ-45 connector.

Packet

Data that consists of units transmitted on a network are called packets. Each packet consists of a header, which contains the information about the source and destination addresses of the packet, and a data field.

Ping

A program used to check whether the host associated with an IP address can connect to the network. It can also be used to reveal the IP address for a given domain name.

Port

A physical access point on a device such as a computer or router, through which data flows into and out of the device.

PPP

Point-to-point protocol. It is a communication protocol for data transmission between devices over the standard telephone line. The WAN port on the DR814Q uses two types of the PPP, that is, PPPoA and PPPoE.

PPPoA

Point-to-point protocol over ATM. One of the two types of PPP interfaces. The other type is PPPoE. You can specify only one PPPoA interface for each VC.

PPPoE

Point-to-point protocol over Ethernet. One of the two types of PPP interfaces. The other type is PPPoA. You can specify multiple PPPoE interfaces for each VC.

Protocol

A set of rules to govern the data transmission. The two connected ends must obey these rules to transmit data.

Remote

A geographically separated location. For example, an employee on travel who logs into the company's intranet is a remote user.

RJ-11

The standard connector used to connect telephones, fax machines, and Modems to a telephone port. It is a 6-pin connector usually holding four wires.

RJ-45

The 8-pin connector used for transmitting data over the telephone lines. Straight-through cables are usually the connector of this type.

Routing

Forwarding data between the local network and the Internet through the most efficient path, based on the data's destination IP address and current network conditions. A device that performs routing is called a router.

SNMP

Simple network management protocol (SNMP), a network management standard, is widely used in the TCP/IP network. SNMP provides a way to manage the network nodes from the host located in the center of the network, such as the server, work

station, router, bridge, and hub. It usually performs the management through the distributed structure administration and proxy.

Subnet

A subnet is a separate part of a network. The subnet mask is used to break a large network into pieces by adding additional bits to the host portion of IP address. A host in a subnet is physically connected to its host in the network, however, each of them is in an individual division of network.

TCP/IP

Transmission control protocol/internet protocol.

It defines a suite of the basic protocols, not just the TCP/IP protocol, for the network communication.

Telnet

An interactive, character-based program used to access a remote computer. The HTTP and FTP only allow you to download files from a remote computer, while Telnet allows you to log into and use a computer from a remote location.

Twisted pair

A common copper cable used for the telephony application. It contains one or more cable pairs twisted together to minimize the interference and the noise. In an Ethernet LAN, category 3 cable is used for the 10Base-T network while the category 5 cable, the higher level, is used for the 100Base-T network.

Upstream

The upstream flows from users to the Internet.

USB

Universal serial bus. A serial interface that attaches the devices such as printers and scanners to the computer. The DR814Q provides a USB port to connect a computer.

VC

Virtual circuit. A connection from the DSL router to the ISP.

VCI

Virtual channel identifier. Together with the virtual path identifier (VPI), the VCI uniquely identifies a virtual circuit (VC).The ISP provides the VCI value for each VC.

VPI

Virtual channel identifier. Together with the virtual path identifier (VPI), the VCI uniquely identifies a virtual circuit (VC).The ISP provides the VPI value for each VC.

WAN

Wide area network. A network covering a large area such as a country or a continent is called a WAN. With respect to the ADSL router, WAN refers to the Internet.

Web browser

A software program that uses hypertext transfer protocol (HTTP) to download information from (and upload to) websites, and displays the information consisting of text, graphic images, audio, and video. The popular Web browsers are Netscape Navigator and Microsoft Internet Explorer.

Web page

A website file typically containing text, graphic images and hyperlinks to the other pages. When you access a website, the first displayed page is called the home page.

ZIPB

Zero installation PPP bridge. This technology ensures that a home user obtains a public IP address through the Modem, and access the Internet without configuring NAT on the Modem or installing the PPP client on the Scathe ZIPB mode becomes active when it is enabled, IPCP negotiation is complete over the WAN PPP link, and a DHCPDISCOVER is received on the Modem LAN interface.